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STUDIES IN NEOTROPICAL MALLOPHAGA XII (PART 3)

LICE OF THE TINAMOUS

by

M. A. Carriker Jr.

Resumen

ESTUDIOS DE MALLOPHAGA NEOTROPICALES XII *(PART 3). LOS PIOJOS DE LOS TINAMIDAE.* El autor trata detalladamente los géneros *Physconella* Payne, *Megaginus* Carriker y *Nothocotus* Carriker y cita los Tinamidae que hospedan las distintas especies de cada uno. Describe por primera vez las siguientes especies y subespecies: *Physconella nothocercae julia, P. hamata cinerea, P. emersoni, Megaginus emarginatus caquetensis, M. sordidus felisae, M. tessellatus, M. tataupensis, Nothocotus parvithorax centralis, N. genitalis* y *N. distinctus.*

FAMILY **PHYSCONELLIDAE**

GENUS *PHYSCONELLA* Paine

Specimens of this interesting genus are very rare, so that our knowledge of it is not as complete as in many other genera of the Tinamou lice.

At the present time but five species and subspecies of it have been described, the genotype by Paine in 1913 and the other four by the author in 1936.

The host for *P. kelloggi* Paine (the genotype) was given by Paine as *Chamaepelia rufipennis*, collected on the Canal Zone of Panama, which was in error, and in 1936 (p. 94) I stated that its true host was probably *Crypturellus soui panamensis*, since specimens equal to or close to it had been taken on various races of *Crypturellus soui.*

Additional material now at hand, taken on *Crypturellus soui harterti*, at Acandí, Colombia (on the Panama frontier) substantiate my previous conjecture as to the true host of the species (*P. kelloggi* PAINE).

A male specimen taken at Acandí is practically the same as the description and figure given by PAINE for *kelloggi* (♂). There are slight discrepancies in the measurements, but not beyond the maximum of individual variation. A careful study of all the material now before me shows previously unrecorded characters more or less developed in all of the known species of the genus except *nothocercae* CARRIKER and *P. n. julia* n. subsp. (described in this paper).

These characters are the presence of rows of slightly raised papillae, somewhat similar to those found on the pleurites and tergites of *Pectenosoma*, except that in *Physconella* they are but faintly chitinized, and are present not only on the pleurites but in the head in the form of large, oblong papillae extending from the base of the antennary sinus backward to the deeply colored incrassation at the posterior margin of the temples.

There is also, sometimes, a row of such papillae (less well developed) acros the front of the head just in front of the bucal cavity. The rows of papillae on the pleurites are just outside, and parallel to, the heavy, deeply colored bars that bear the hooks, on segments II to VI, while on I they are along the outer margin of this bar, adjoining the hyaline margin. These papillae are not always well developed or sharply defined, but seem to be more evident in *kelloggi* and *subsimilis*. There is no trace of them in *nothocercae*.

Physconella kelloggi PAINE.

Ancistrocephalus kelloggi PAINE, Psyche. Oct. 1913, p. 158 (Host: *Chamaepelia rufipennis* (equals: *Crypturellus soui panamensis*), Río Indio, Canal Zone, Panama, Mar. 3, 1911.).

Physconella kelloggi PAINE, Psyche, Nov. 1914 (*Nom. nov.* for *Ancistrocephalus* PAINE, 1913). A re-examination of all the material in my collection shows that this species is found on several races of *Crypturellus soui* in Colombia, as well as on *panamensis*.

A single male from *C. s. harterti*, collected at Acandí, Chocó, is undoubtedly true *kelloggi*, while a female form *C. s. caucae*, taken at Tarazá, Antioquia is the same thing.

One male and four females taken on *C. s. mustelinus*, in the Dept. of Magdalena, show a slight tendency towards *subsimilis*, having the abdominal hooks slightly more developed, but in all other respects (including size) they are very close to true *kelloggi*.

On the other hand, a single female taken on *C. s. caquetae*, at Pto. Venecia, Int. de Caquetá, Colombia, cannot be distinguished from *P. k. subsimilis* from Bolivia, of which I have 3 ♂♂ and 3 ♀♀ paratypes. A single pair (♂♀), taken on *C. s. meserythrus* at Cerro Tuxtla, Vera Cruz, Mexico, cannot be distinguished from paratypes of *subsimilis*.

Physconella kelloggi subsimilis CARRIKER.

This is not a strongly differentiated race, and I think that on some races of *Crypturellus soui* specimens of it will be found that are intermediates and difficult of allocation.

However, the bolivian specimens from *C. s. inconspicuus* may be distinguished by the greater development of the abdominal hooks on pleurites III to V, smaller size of insect, longer frontal hooks, and larger first antennal segment.

The single female from *C. s. caquetae* has the pleural and frontal hooks even more strongly developed than in typical *subsimilis* from Bolivia, but in all other respects it is the same. The scarcity of specimens, especially the males, makes the genus a very difficult one to study, since the male genitalia differ strongly in the different species. The genitalia of *kelloggi* and *subsimilis* are identical, but those of *hamata* and *genitalis* are quite different.

Unquestionably *P. k. kelloggi* and *P. kelloggi subsimilis* are confined to the various races of *Crypturellus soui*, while *hamata* and its races are apparently found on the larger species of *Crypturellus*.

Physconella nothocercae Carriker.

Stud. in Neotr. Mall. I, 1936, p. 97 (Host: *Nothocercus nigricapillus*).

This species was described from a single female, which is not now available for study. However, I do still have the two females referred to in the original description, collected at Huacapistana, Peru, and in addition, two ♀♀ taken on a skin of *Nothocercus nigricapillus* from Bolivia, kindly loaned to me by Lt. Col K. C. Emerson, and in addition four ♀♀ from *Nothocercus bonapartei*, three from the Sierra Perijá (referred to in my 1944 report, p. 123), and one from Río Samaná, Dept. Caldas, Colombia, taken in june 1951.

The male sex of this species is still unknown, and until examination of the genitalia can be made, its relationships with other species cannot be fully determined.

The species may be recognized by the strongly convex *frons*, long frontal hooks; quadrangular prothorax (side straight, but divergent); straight or slightly concave lateral margins on adbominal segment I; medium-sized pleural hooks; entire absence of rows of papillae on pleurites or head; and especially by the well-marked patches of rather long setae on the mesonotum, a character absent on all other known species of the genus excepting *P. n. julia*, described below.

It will be very interesting to see what type of male genitalia is possessed by this species, but it will probably be found to be similar to that of *P. n. julia* (see fig.).

Physconella nothocercae julia n. subsp.

Plate I, figs. 1 and 2; Plate II, fig. 3

Type, male adult, from *Nothocercus j. julius* (Bonaparte), collected by the author above Bucaramanga, Colombia, Aug. 22, 1949 (in coll. of author).

Diagnosis: This form seems to be conspecific with *nothocercae*, but cannot be properly compared with it until the male of *nothocercae* is secured, or the female of *julia* (preferably the former). It agrees with *nothocercae* in the shape of the head, but has the *frons* more strongly arched. The antennae are quite different,

and present a type hitherto not found in this genus. Segment 1 is much enlarged, with 2 short and thick; 3 short and slightly hooked at distal end, while 4 and 5 are of the normal shape and length for the genus. It may well be that this species (as well as *nothocercae)* has slightly dimorphic antennae, and that the female of *julia* will have the same type of antennae as in *nothocercae* (♀).

The incrassations at the occipital margin of head are the same as in *nothocercae*, but the head is longer and narrower (.303 x .355 against .28 by .38). The prothorax is of same shape and size (.105 x .26 against .108 x .27). The posterior margin of abdominal segment I is different (see fig.), being uniformly convex (inside of pleurite), while in *nothocercae* each side of this margin is practically straight, and angulated medially.

The lateral margins of abdominal segment I to V have a rather wide hyaline margin, present only on segment I in *nothocercae*. The abdominal hooks on pleurite II (none on I) are small, straight and pointed, those on III, IV and V are strongly developed and bent inwards, almost as in *hamata,* except that they are thicker and their supporting bands wider (see fig.); the hook on VI is thick, bluntly pointed and almost straight.

The male genitalia is very different from any other known species of the genus, and needs no additional description (see fig.). The species is known only from the male holotype. (Measurements of type follow the next species).

Physconella hamata cinerea n. subsp.

Plate II, figs. 2 and 4; Pl. III, f. 1

Type, male adult, from *Crypturellus c. cinereus* (GMELIN), collected by the author at Pto. Venecia, Int. de Caquetá, Colombia, June 14, 1952 (In U.S. Nat. Mus.)

Diagnosis.—There are very few differences in the measurements between *P. h. hamata, P. hamata genitalis* and the present race. The measurements, as a whole, are very close to those of *P. h. genitalis,* except that the total length is greater (.98 against .94) and the abdomen is shorter and much narrower (.575 x .597 against .617 x .67), in this respect being much nearer to the

nominate race, which is .585 x .617, while the total length is also close to *hamata* (.98 against 1.00).

The pleurites are wider and the abdominal hooks are *all* heavier, with their points more recurving upward on segments III to V, while the hooks on II and VI are much thicker, II noticeably curving and VI long, with sharply recurved tip.

The rows of papillae are poorly developed and difficult to see on the pleurites, but there are double rows of large papillae across the anterior edge of tergites I to VI. There is a single row of large papillae extending from the antennary fossae to the occipital incrassation and a double row across the front of the head. The long pustulated hairs are present at posterior edge of tergites II, III and IV, as in *hamata* (lacking on IV in *genitalis*).

The sides of the prothorax are more rounded and the lateral angles bear a strong hair, more protruding, while the hair itself is longer, and thicker basally.

The genital armature resembles very much that of *hamata*, but the paramers are longer and thicker medially and the endomeral plate is larger, with thickened lateral margins; the basal plate also differs slightly in chape (see fig.). Known only from the ♂ holotype.

Measurements follow the next species.

Physconella emersoni n. species

Plate I, fig. 3; Pl. II, figs. 1 and 5

Types, male and female adults, from *Crypturellus undulatus adspersus* (TEMMINCK), collected from museum skin in Germany by Lt. Col. K. C. EMERSON in 1952 (type in EMERSON coll.)

Diagnosis.—Nearest in some characters to *P. h. hamata*, but differs radically from *hamata* and all other known species of the genus in the structure of the pleural bands and their corresponding hooks. It is also considerably larger.

The *frons* is narrow and almost transverse, with basal portion of frontal hooks much thickened and extending beyond line of *frons*, while the hooks themselves are rather slender and much

shorter than in *hamata*. The antennal bands are wide and curve backwards around the antennary fossae to join the large ocular blotch, thus forming a continuous band from the outer, posterior corner of the antennary fossae to the frons, but which is less strongly chitinized back of antennary fossae. The incrassations on occipital margins of head differ from those of *hamata* (see fig.) as well as the prothoracic bands.

There are lines of papillae from the antennary fossae to the occipital blotches, more clearly defined in the female than the male, but there are no papillae across the front of head or on the tergites. The prothorax is similar to that of *hamata*; the margin of abdominal segment I is broadly hyaline, with obsolete papillae along inner edge of hyaline band; the posterior margin of segment I (inside the pleurites) has the sides flatly convex and median portion broadly rounded.

Abdominal pleurites II to VI have a unique structure. There is the usual heavy, outer marginal band and the diagonal band bearing at its posterior end the hook, but this latter band is of unusual shape, being narrow at anterior end, widening medially and then narrowing again where the hook joins, but with another short band diverging from the inner side of the base of the hook (see fig.) The portion of the pleurites not occupied by the two bands has a "tessellated" appearance, seemingly covered with densely pecked, slightly raised papillae. The points of the hooks are short, sharply bent inward, and hollowed out on the inner side on III and IV (see fig.) .

The entire chaetotaxy is unusually short and rather slender, but not otherwise distinctive. The long pustulated hair on tergite IV is wanting. The male genitalia are also quite distinctive, in shape of basal plate, paramers and endomera (see fig.).

Described from ♂ holotype, ♀ allotype, 1 adult ♂ paratype and 1 nymph.

A single male, slightly immature, from skin of *Crypturellus u. undulatus* (Temminck), also collected by Col. Emerson on a

german museum skin, is apparently the same thing, but while the structure of the abdominal hooks is somewhat different, I believe this to be due to immaturity, these hooks being obsolete in the earlier instars, and not fully developed until the insect is completely adult.

Measurements of *P. nothocercae julia* (♂); *P. hamata cinerea* (♂) and *P. emersoni* (♂ ♀).

	♂ length	♂ width	♂ length	♂ width	♂ length	♂ width	♀ length	♀ width
Body	1.05	—	.98	—	1.10	—	1.09	—
Head *frons*	—	.293	—	.25	—	.288	—	.287
Head temples	.282	.355	.24	.335	.25	.34	.245	.35
Head occiput	.303	—	.27	—	.255	—	.26	—
Prothorax	.105	.26	.103	.25	.119	.24	.12	.248
Pterothorax	.163	.337	.152	.34	.152	.347	.162	.358
Abdomen	.61	.635	.575	.597	.65	.72	.695	.78
Antennae	.26	.05	.27	.042	.265	.043	.25	.045
Basal plate	.195	.065	.24	.077	.26	.076		
Paramers	.11	.084	.056	.04	.056	.038		
Endomera	.108	.032	.051	.031	.051	.028		

GENUS *MEGAGINUS* Carriker

Like *Physconella*, specimens of this genus are seldom encountered, but when present, sometimes as many as 10 to 13 have been taken by the author on a single individual of various races of *Crypturellus soui*, which are the hosts upon which it is most often found. The males are not often taken and four of the ten known forms are known only from the females. The male genitalia in the six known species are very similar in structure and rudimentary in type, but there are always some slight differences in detail.

The abdominal structure has not previously been clearly described. The sclerites consist of tergites and pleurites, there being no clearly defined sclerotized sternites except a large genital plate in the male, which lies exactly underneath segment seven but is considerably longer than tergite VII, about one fourth of its length being exposed and extending to the posterior edge of

segment IV. This sternite is weakly sclerotized and is not always clearly visible.

Tergites I and VI are entire in both sexes, while in the female the median anterior margin of VII is fused to VI, with the suture invisible, while II to V are divided medially, with rounded ends almost touching in the female, but more widely separated in the male, both medially and longitudinally.

The pleurites are entirely ventral and the lateral incrassations, sharply defined in most species, consist of a longitudinal bar across the pleurite and a transverse band on the tergite, the latter usually somewhat curved and extending more or less from the anterior outer corner to the inner margin of the pleurite, or beyond this margin, but in at least two cases they are short and transverse. What appears to be a third, transverse band across the posterior portion of the pleurite is, in reality, merely the broad overlapping of the tergites.

Most all of the known forms have at least a portion of the surface of the tergites and pleurites strongly rugose, giving an appearance of "hammered" brass, the surface being covered with minute dents, the raised portion being on the outside of the sclerites. When present, this rugosity covers the whole of the pleurites and sometimes most of the tergites (excepting the portion inside of the pleurites), but is usually confined to the lateral portion, that is, the portion over the pleurites. The shape and position of these bars on tergites and pleurites, as well as the presence or amount of rugosity on them varies considerably in the different species and are good diagnostic characters, taken in connection with the shape of the head and prothorax.

These insects are so small that characters differing between species are often so minute that they seem of little importance, while the same characters, having the same degree of difference in larger species would be easily recognized.

There follows a brief diagnosis of each of the six previously described species and subspecies, and more complete descriptions of the four new forms.

M. e. emarginatus Carriker.

Plate IV, fig. 1

Hosts: *Crypturellus obsoletus punensis, C. o. ochraceiventris* and *C. o. crucis.*

The head forms an equilateral triangle, with whole side from tip of *frons* to middle of temple straight; the *frons* narrow, with tips rounded, of medium size and emargination *small;* dorsal clypeal bands heavily chitinized on posterior half, but narrow basally and expanding anteriorly and gradually dissapearing, except for a narrow, less heavily chitinized margin which extends to the tips of the *frons*, but is much less developed than in *excavatus.* Prothorax with sides more divergent and with anterior portion constricted laterally.

Tergite I in ♀ wider medially than in other races and tergites II and III are joined medially for the posterior third of their width, but in ♂ all tergites are separated medially except I and VI and all are more tapering towards inner ends, leaving considerably wider hyaline areas between them, especially segment III to VI (This difference between the sexes is present in a varying degree in all species).

Pleural band well developed, lying near inner edge of sclerite, but tergal band obsolete in male and short and wide in female, extending only a short distance beyond each margin of pleural bar.

M. emarginatus excavatus Carriker.

Plate IV, fig. 2

Host: *Crypturellus soui inconspicuus.*

Head short, temples large and expanded laterally; pre-antennary area constricted medially, with strongly defined marginal clypeal bands extending to edge of frontal emargination, which has the tips rounded on the outer side and *concave* on the inner.

The longitudinal bands on pleurites are wide, sharply marked, are in median portion of sclerite and extend from one end to other. The transverse bands on tergites also wide and sharply defined, extending from outer anterior corner to inner margin of pleurite, only.

M. emarginatus dissimilis Carriker.

Plate IV, fig. 3

Host: *Crypturellus soui nigriceps.*

Head longer, temples slightly expanded laterally and preantennary area larger, with sides strongly and uniformly concave (not constricted and angulated medially as in *excavatus*). Marginal clypeal band obsolete on anterior third of preantennary margin and tips of *frons* uniformly rounded on both sides. Longitudinal bands on pleurites also wide and long (as in *excavatus*), but they lie close to the inner edge of pleurite; transverse bands *wide*, with a conspicuous dusky median line, and beginning just outside of longitudinal bar they extend for some distance *inside* of pleurite, especially on II to IV.

M. laticlypeus Carriker.

Plate IV, fig. 5

Host: *Crypturellus soui meserythrus.*

Head narrow, temples little expanded laterally; preantennary area wider, with almost straight sides; *frons* with emargination very narrow and shallow; clypeal bands ending at middle of clypeus. Abdominal pleural and tergal bands practically the same as in *excavatus.*

(***Note.***—All species have the inner, posterior corner of pleurites II to IV (sometimes V) produced to a slender point extending backward some distance beyond the anterior end of succeding pleurite.)

M. quadrithorax Carriker.

Plate IV, fig. 4

Host: *Tinamus major fuscipennis,* originally given incorrectly as *T. m. robustus.*

The original figure of the prothorax in this species is not entirely correct, the sides being more divergent than shown in that figure, being almost identical in this respect with *M. c excavatus* and *dissimilis*, except that the segment is longer in *quadrithorax* and the postero-lateral angles less rounded.

The head is shaped much as in *emarginatus* but the clypeal bands are different and the prothorax (see figs. of six previously described species). The clypeal bands are wider anteriorly, with

two narrow sutures leading to bases of setae, while the frontal emargination is larger and *frons* wider. The occipital bands are wider than usual, but not strongly chitinized; the pleurites are unusually small, with longitudinal bands well developed, slightly curving, and in middle of sclerite; the transverse bands are short and wide, extending from anterior outer corner to inner edge of pleurite.

M. s. sordidus Carriker

Plate IV, fig. 6

Host: *Crypturellus cinereus berlepschi.*

Head rather large with short preantennary area, wide *frons* with small emargination and broadly rounded tips; temples much expanded, with a diagonal line across postero-lateral portion, with the margin outside of this line *depressed* and with a strong, pustulated hair set in each end of this depression (dorsally). The dorsal clypeal bands are narrow and faintly chitinized, and obsolete on anterior third of clypeus.

The pleurites are narrow and faintly chitinized. In the types there are *no* tergal or pleural bands and the tergites and pleurites are poorly chitinized, although the ventral clypeal and occipital bands of head are strongly colored, as well as the prothoracic bands and actetabular bars. Tergites II and III in female are fused medially at posterior third.

A single female from Ecuador (from same host) is very similar to the type, excepting the frontal emargination is somewhat shallower and the depression across the temples less pronounced. The pleurites are the same (narrow), poorly chitinized, as well as the tergites, but there are faintly developed longitudinal pleural bars on segments I to III.

Megaginus emarginatus caquetensis n. subsp.

Plate IV, fig. 7 and figs. 8a, b, c, *and* d

Types, male and female adults, from *Crypturellus soui caquetae* (Chapmann), collected by the author at Pto. Venecia, Int. Caquetá, Colombia, June 21, 1952 (In U.S. Nat. Museum).

Diagnosis.—This subspecies is closest to *M. e. excavatus* Carriker, differing from that race in the shape of the frontal emargi-

nation, the shape of the head, the terminal abdominal segments in the female and slightly in the male genitalia. Its affinities with *excavatus* are logical, since the host of that species is *C. soui inconspicuus* of eastern Bolivia.

The head is considerably narrower than in *excavatus* (♂ : .37 x .51 against .37 x .55); the prothorax is smaller, the pterothorax slightly longer and the abdomen smaller and shorter, being wider than long in both sexes (♂ : .467 x .50 against .54 x .54).

Segment VII in the female is much longer and of distinct shape and the incrassations of the tergites and pleurites are of a different pattern from both *emarginatus* and *excavatus*, resembling more those of *laticlypeatus*.

The male genital armature differs from that of *excavatus* in having a shorter basal plate, slightly shorter paramers, and in the structure of the endomera (see fig.)

The type series consists of ♂ holotype, ♀ allotype, 3 ♂♂ and 9 ♂♂ paratypes. Measurements follow succeeding species of this genus.

Megaginus sordidus felisae n. subsp.

Plate III, fig. 3; Pl. V, fig. 4

Type, female adult, from *Crypturellus c. cinereus* (GMELIN), collected by the author at Pto. Venecia, Int. Caquetá, Colombia, June 14, 1952 (in coll. U.S. Nat. Mus.)

Diagnosis.—Clearly allied to *M. s. sordidus*, agreeing with that species in the shape of the head, size and shape of the frontal emargination, faintly developed pleural and tergal incrassations, and the setae-bearing depression across the latero-posterior portion of the temples.

It differs from *sordidus* in smaller size of head, markings of the head, smaller frontal emargination; more strongly developed incrassations on abdomen and in having well-marked rugosity on outer portion of pleurites, resembling, in a lesser degree, this character as found in *M. tessellatus* (described on subsequent page).

Described from a single female, the male being unknown.

Measurements of the types of *M. e. caquetensis* (♂ ♀) and of *M. sordidus felisae* (♀).

		♂ length	♂ width	♀ length	♀ width	♀ length	♀ width
Body		.97	—	1.15	—	1.14	—
Head	at *coni*	—	.365	—	.358	—	.336
	temples	.39	.51	.402	.52	.37	.531
	occiput	.38	—	.398	—	.38	—
Prothorax		.09	.26	.108	.282	.12	.293
Pterothorax		.205	.36	.23	.39	.23	.40
Abdomen		.467	.50	.62	.586	.63	.564
Antennae		.16	—	.185	—	.152	.03
Basal plate		.14	.055				
Paramers		.087	.05				
Endomera		.067	.026				

Megaginus tessellatus n. species.

Plate III, fig. 2

Types, male and female adults, from *Crypturellus t. tataupa* (Temminck), coll. Anduze at Sta. Elena, Gran Sabana, Venezuela, June 1946 (type in Dept. Higiene, Caracas, Venezuela).

Diagnosis.—One of the larger species of the genus, with very wide head both at *coni* and temples (.456 and .634), and with abdomen as wide as long (.673); the sides of the preantennary area are deeply concave, the occiput very strongly convex, the frontal emargination wide and deep but with the tips of *frons* rounded (not pointed); temples much expanded and uniformly circular; abdominal incrassations weakly chitinized, consisting of the longitudinal, pleural bar near the inner edge of that sclerite and the short, transverse tergal bar, having the appearance of three parallel lines, beginning just outside of pleural bar and extending inward slightly over inner edge of pleurite.

The entire surface of the pleurites, outside of the longitudinal bar is strongly rugose, with some trace of rugosity inside this bar. Measurements follow next species.

The type series consists of the ♀ holotype and 3 ♀ ♀ paratypes, the male being unknown.

Megaginus tataupensis n. species.

Plate III, figs. 4a, b *and* c.

Types, male and female adults, from *Crypturellus t. tataupa* (Temminck), collected by the author at Rio Lipeo, S. frontier of Bolivia, Aug. 9, 1936 (In coll. of the author).

Diagnosis.—Size and shape of head very much like *M. s. sordidus,* but differs from that species as follows: Temples somewhat smaller; margin of preantennary area almost straight; frontal emargination smaller, with tips narrower and whole *frons* narrower; clypeal bands (dorsal) rather strongly chitinized and extending to tips of *frons,* similar to those of *excavatus;* occipital bands well chitinized and a prominent, rather deeply colored band paralleling occiput; occipital signature *round* and unusually prominent.

Prothorax short, with sides straight and divergent, and slightly wider than both *excavatus* and *dissimilis.* The abdomen in male is wider than long, in female longer than wide. The pleurites are narrow, with long slender points at inner, posterior angles; the longitudinal bars are well developed, curving in shape and extend the full length of the pleurites; the tergal bars are short, transverse, expanded at outer end, just outside longitudinal bar, and do not reach to inner edge of pleurite. Segment VII of female is wider than usual, with sides strongly divergent from the narrow, fused, anterior end, while posteriorly it extends much beyond tips of segment VI (see figs.).

The male genitalia is typical of the genus, but the paramers are uniformly thickened apically, as in *quadrithorax.* The endomeral plate is partially covered by extraneous matter and cannot be properly drawn in all details. Described from ♂ holotype and ♀ allotype.

Measurements of the types of *M. tessellatus* (♀) and *M. tataupensis* (♂ ♀).

	♀ length	♀ width	♂ length	♂ width	♀ length	♀ width
Body	1.31	—	1.09	—	1.19	—
Head *coni*	—	.456	—	.41	—	.41
Head temples	.436	.634	.413	.597	.415	.62
Head occiput	.456	—	.41	—	.415	—
Prothorax	.15	.326	.098	.302	.115	.31
Pterothorax	.240	.442	.207	.41	.228	.434
Abdomen	.673	.673	.564	.595	.65	.63
Antennae	.217	.033	.19	.034	.185	.035
Basal plate			.185	.075		
Paramers			.11	.065		
Endomera			.076	.03		

GENUS *NOTHOCOTUS* CARRIKER

This, also, is a genus of few known species, of small size, and confined to the avian genus *Nothocercus*, having now been taken on six species and subspecies of it.

After the publication of my 1944 report on this genus (p. 133) additional paratypes of *N. p. parvithorax* were discovered in my collection, 3 ♂ ♂ and 3 ♀ ♀, with another ♀ remaining from the type series. There is also a series of 7 ♂ ♂ and 14 ♀ ♀ taken on various individuals of the type host (*Nothocercus b. bonapartei*) in the Sierra Perijá of Colombia.

N. parvithorax subsimilis is represented by one female from the type host collected also at Leimabamba, Perú; one female from *Nothocercus n. nigricapillus* (intermediate with *N. n. cadwaladeri*), collected at Santo Domingo, S. Peru, and 2 ♂ ♂ and 2 ♀ ♀ from a bird shot at Huacapistana, Peru (also an intermediate). I have also received from Col. Emerson a series of 2 ♂ ♂ and 3 ♀ ♀ of what is clearly *subsimilis*, taken on a skin of *Nothocercus n. nigricapillus* in a W. Germany museum, which was collected in Bolivia.

In addition to the above there is the material treated on subsequent pages, from which three new forms of the genus are described, one strikingly distinct new species from Costa Rica.

After a careful examination of this material it is clear that certain errors and ommissions were made by me in the original description of the genus and species (1936), which I shall now try to rectify. In the 1944 report (pps. 131 and 133) new figures were

given of the head and male genitalia of *parvithorax*, drawn from Colombian material, which now proves to be identical with the later discovered paratypes from Venezuela, and so may be considered correct.

The original description of the pterothorax is not entirely correct. Excepting for a short suture at each side the meso and metathorax are completely fused into a typical pterothorax, which is deeply imbedded within abdominal segment I and *completely fused* with that segment along the median portion of its posterior margin (see fig. of *distinctus*).

The abdominal structure was also not properly described. The arrangement of the tergites and pleurites is precisely the same as in *Megaginus*, as explained previously in this paper, the short diagonal bar being on the *centrally placed* pleurite and the transverse bands on the tergites which, unlike *Megaginus*, extend unbroken across the abdomen. Pleurites II to V are also furnished with the same slender point at inner posterior corner, less pronounced on V, but unlike *Megaginus*, each is furnished with a stout seta, short in the male and much longer in the female (as long as pleurite on III an IV); Another seta of about the same length is set at the middle of posterior margin of pleurites II to V (also absent in *Megaginus*). Tergite VII in the female is not fused medially with VI, (as in *Megaginus*) while there is present a large genital sternite covering all of tergite VII and extending to anterior edge of tergite VI. There is also in the male sex a large genital sternite, narrower than tergite VII, which extends from tip of abdomen to middle of tergite V. In the females the tergites almost fill the segments in II to VI, but in the male there is a considerable hyaline space between them, increasing in width posteriorly.

Nothocotus parvithorax centralis n. subsp.

Plate VI, figs. 1a, 1b, and 2

Types, male and female adults, from *Nothocercus b. bonapartei* (G. R. Gray), collected by the author on the Rio Samaná, Dept. Caldas, Colombia, May 12 1951 (in U.S. Nat. Mus.)

Diagnosis.—Very close to *parvithorax* in size, but differs decidedly in the head bands. There is a deeply colored internal clypeal

band, joined basally with the marginal clypeal band and encircling the hyaline bucal cavity and ending at the posterior margin of the wide band which encircles the *frons*. The conspicuous blotches on the marginal (dorsal) clypeal band in *parvithorax* are but faintly indicated. The pre-antennary margin of the head is *strongly concave*, not slightly to strongly convex as in the other species of the genus.

The male genitalia is of the same type as in *subsimilis*, the paramers extending backwards almost to the ends of the internal bands of the basal plate, but encircled latterly on their basal third by extensions of the basal plate. The endomeral plate seems to be similar to that of *parvithorax* but differs in detail.

A careful re-examination was made of the genitalia of three male paratypes of *parvithorax* (from La Cumbre de Valencia, Venezuela) and one male from the Sierra Perijá, Colombia. All of these specimens had been cleared to the point where the more delicate, poorly chitinized parts of the endomera are scarcely visible. However, in one specimen there are faintly visible the lateral prongs at the tip of the endomera (see fig. of genitalia of *centralis*). I strongly suspect that properly treated specimens of *parvithorax* will show the endomeral plate quite similar to that of *centralis*.

The type series consist of the ♂ holotype, ♀ allotype, 4 ♂♂ and 12 ♀♀ paratypes. Two ♂♂ from *Nothocercus bonapartei intercedens*, collected above Frontino, Antioquia, and one ♀ from *N. b. bonapartei* from Belen, Dept. Huila, are all exactly like the type series from *N. b. bonapartei*, although taken on individuals collected at great distances from each other. Measurements follow the next species.

Nothocotus genitalis n. species.

Pl. V, fig. 3 and Pl. VI, figs. 3a, b.

Types, male and female adults, from *Nothocercus j. julius* (BONAPARTE), collected by the author at Alto del Pozo, Dept. Santander N, Colombia, Sept. 17, 1946 (In coll. of author).

Diagnosis.—In size this species is close to *parvithorax*, with the exception of the head of the female, which is wider, and the abdomen in both sexes is longer and wider.

The head bands are the same as in *parrithorax* but the incrassations of the paratergals are quite different (see fig.) The apical segment of the abdomen in the male is much larger, angulated on posterior portion, and extends far beyond VI.

The male genitalia is of a somewhat different type, and is the best character for separating the species. The basal plate is shorter and wider, the paramers slightly longer, but much wider and of distinct shape, while the endomeral plate is of an unusual pattern and quite complicated (see fig.).

The type series consists of the ♂ holotype, ♀ allotype and 2 ♂♂ and 2 ♀♀ paratypes, also 5 ♂♂ and 1 ♀ from the type host collected near Bucaramanga, Dept. Santander, Colombia, August 22, 1949.

Measurements of *Nothocotus parrithorax centralis* and *N. genitalis*.

	♂ length	♂ width	♀ length	♀ width	♂ length	♂ width	♀ length	♀ width
Body	1.22	—	1.41	—	1.18	—	1.48	—
Head	.42	.445	.43	.467	.41	.465	.435	.52
Prothorax	.13	.30	.14	.303	.13	.303	.14	.314
Pterothorax	.19	.37	.217	.39	.217	.38	.25	.40
Abdomen	.64	.586	.69	.66	.716	.66	.865	.705
Antennae	.217	.054	.195	.032	.217	.05	.175	.043
Basal plate	.23	.09			.24	.135		
Paramers	.14	.094			.16	.13		
Endomera	.105	.06			.13	.11		

Nothocotus distinctus n. species.

Pl. V, figs. 1, 2; Pl. VI, figs. 4, 5

Type, male adult, from *Nothocercus bonapartei frantzii* (LAWRENCE), taken on a skin in a W. Germany museum by Col. K. C. EMERSON, which was collected in Costa Rica (In EMERSON coll.)

Diagnosis.—Head of a strikingly different shape from all other known species of the genus. The pre-antennary area is much shortened, nearly as wide as temples, with sides flatly convex, *frons* broadly rounded and *coni* large. First segment of antennae larger than in *parrithorax* but otherwise similar; antennary fossae large

and deep; sides of temples nearly straight, and but slightly divergent, with posterior portion circular to edge of deeply concave occiput.

Dorsal incrassations of clypeal band similar to those of *parvithorax*, but the ventral bands more like those of *centralis*; phryngeal sclerite and gland large but occipital signature apparently wanting. Prothorax rather large, with convex sides, rounded posterior angles and postero-dorsal margin concave. The pterothorax as in *parvithorax*, but shorter, with exposed sides rounded and the usual three dorsal hairs, two at angle and one inside.

Abdomen very similar to that of *parvithorax* in shape but with lateral incrassations somewhat different and pleurite VI much larger, nearly as large as V. Segment VII is rather deeply emarginate dorsally on posterior margin, but ventral margin convex; genital sternal plate similar to that of *parvithorax*, extending slightly beneath segment V, but is narrower posteriorly than tergite VII.

The male genitalia is strikingly different from all other known forms of this genus, being very large, short and wide, with strongly curving paramers and a complicated endomera (see fig.). Described from a single male, the holotype.

♂	length	width
Body	1.38	—
Head (at *coni*)	—	.37
Head (temples)	.40	.423
Head (occiput)	.38	—
Prothorax	.14	.33
Pterothorax	.195	.434
Abdomen	.676	.694
Antennae	.28	.06
Basal plate	.28	.155
Paramers	.20	.155
Endomera	.145	.115

EXPLANATION OF PLATES

PLATE I

Fig. 1. — *Physconella nothocercae julia* n. subsp. ♂. Head, thorax and segments I and II of abdomen.

Fig. 2. — *Physconella nothocercae julia* n. subsp. ♂. Genitalia and segment VII.

Fig. 3. — *Physconella emersoni* n. sp. ♀.

PLATE II

Fig. 1. — *Physconella emersoni* n. sp. ♂. Pleurites III to VI.

Fig. 2. — *Physconella hamata cinerea* n. subsp. ♂. Pleurites III to V.

Fig. 3. — *Physconella nothocercae julia* n. subsp. ♂. Pleurites III to V.

Fig. 4. — *Physconella hamata cinerea* n. subsp. ♂. Genitalia.

Fig. 5. — *Physconella emersoni* n. sp. ♂. Genitalia and parts of segments VI to VII.

PLATE III

Fig. 1. — *Physconella hamata cinerea* n. subsp. ♂. Head, thorax and abdominal segments I and II.

Fig. 2. — *Megaginus tessellatus* n. sp. ♀.

Fig. 3. — *Megaginus sordidus felisae* n. subsp. ♀.

Fig. 4. — *Megaginus tataupensis* n. sp.

a) ♀. Head, thorax and abdominal segment I.

b) ♀. Abdominal segments V to VII.

c) ♂. Genitalia and abdominal segment VII.

PLATE IV

Fig. 1. — *Megaginus emarginatus emarginatus* CARRIKER. ♀. Head and prothorax.

Fig. 2. — *Megaginus emarginatus excavatus* CARRIKER. ♀. Head and prothorax.

Fig. 3. — *Megaginus emarginatus dissimilis* CARRIKER. ♀. Head and prothorax.

Fig. 4. — *Megaginus quadrithorax* CARRIKER. ♀. Head and prothorax.

Fig. 5. - *Megaginus laticlypeus* CARRIKER. ♀. Head and prothorax.

Fig. 6. — *Megaginus sordidus sordidus* CARRIKER. ♀. Head and prothorax.

Fig. 7. — *Megaginus emarginatus caquetensis* n. subsp. ♀. Tergites and pleurites I to IV (pleurites shaded in I and II, tergites in III and IV).

Fig. 8. — *Megaginus emarginatus caquetensis* n. subsp.

a) ♂. Head and prothorax.

b) ♂. Tip of abdomen.

c) ♀. Tip of abdomen.

d) ♂. Genitalia.

PLATE V

Fig. 1. — *Nothocotus distinctus* n. sp. ♂. Head, thorax and abdominal segment I.

Fig. 2. — *Nothocotus distinctus* n. sp ♂. Genitalia.

Fig. 3. — *Nothocotus genitalis* n. sp. ♂. Genitalia.

Fig. 4. — *Megaginus sordidus felisae* n. subsp. ♀. Tergites and pleurites I to IV.

PLATE VI

Fig. 1. — *Nothocotus parvithorax centralis* n. subsp. ♂.

a) Head.

b) Tip of abdomen.

Fig. 2. — *Nothocotus parvithorax centralis* n. subsp. ♂. Genitalia.

Fig. 3. — *Nothocotus genitalis* n. sp.

a) ♂. Tip of abdomen.

b) ♀. Abdomen.

Fig. 4. — *Nothocotus distinctus* n. sp. ♂. Abdominal segments II and III.

Fig. 5. — *Nothocotus distinctus* n. sp. ♂. Tip of abdomen.

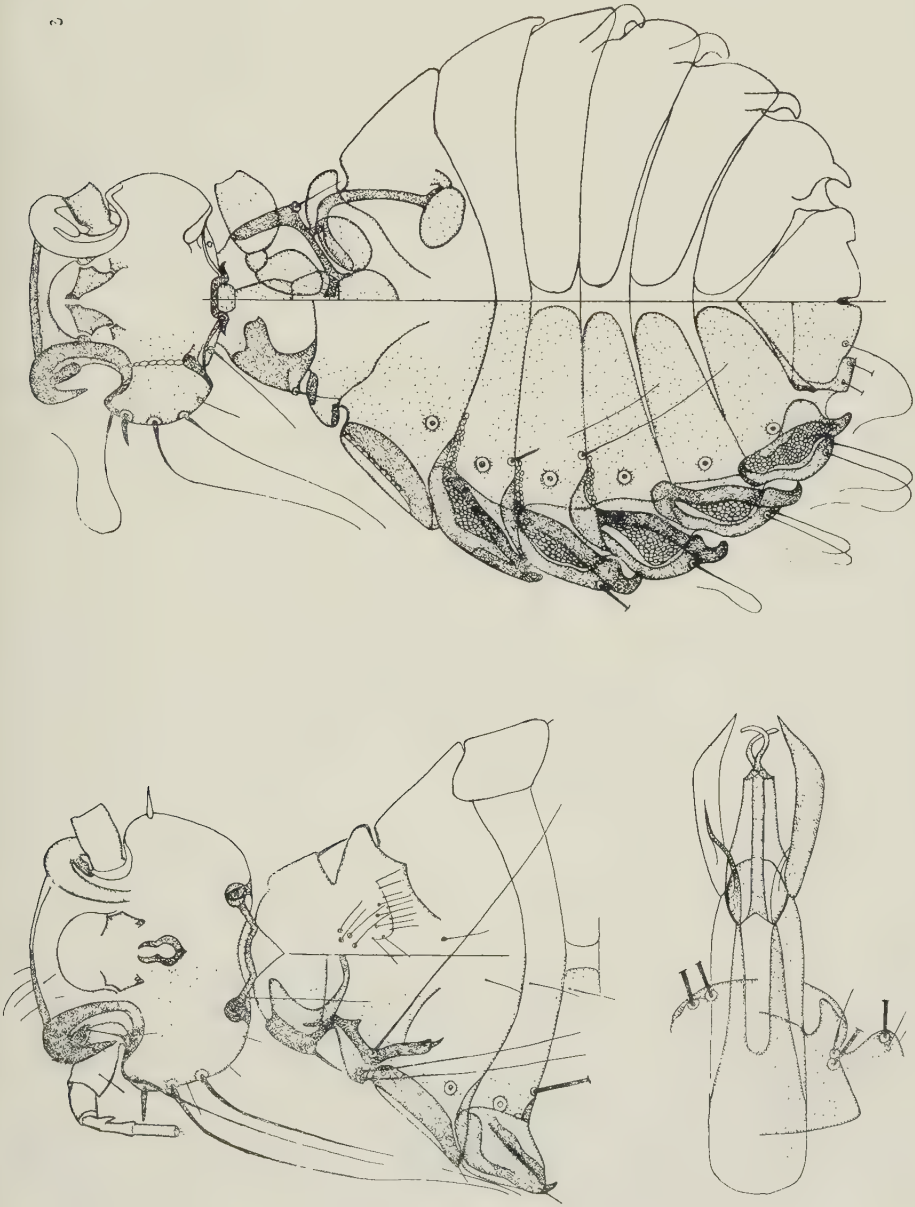


PLATE 1

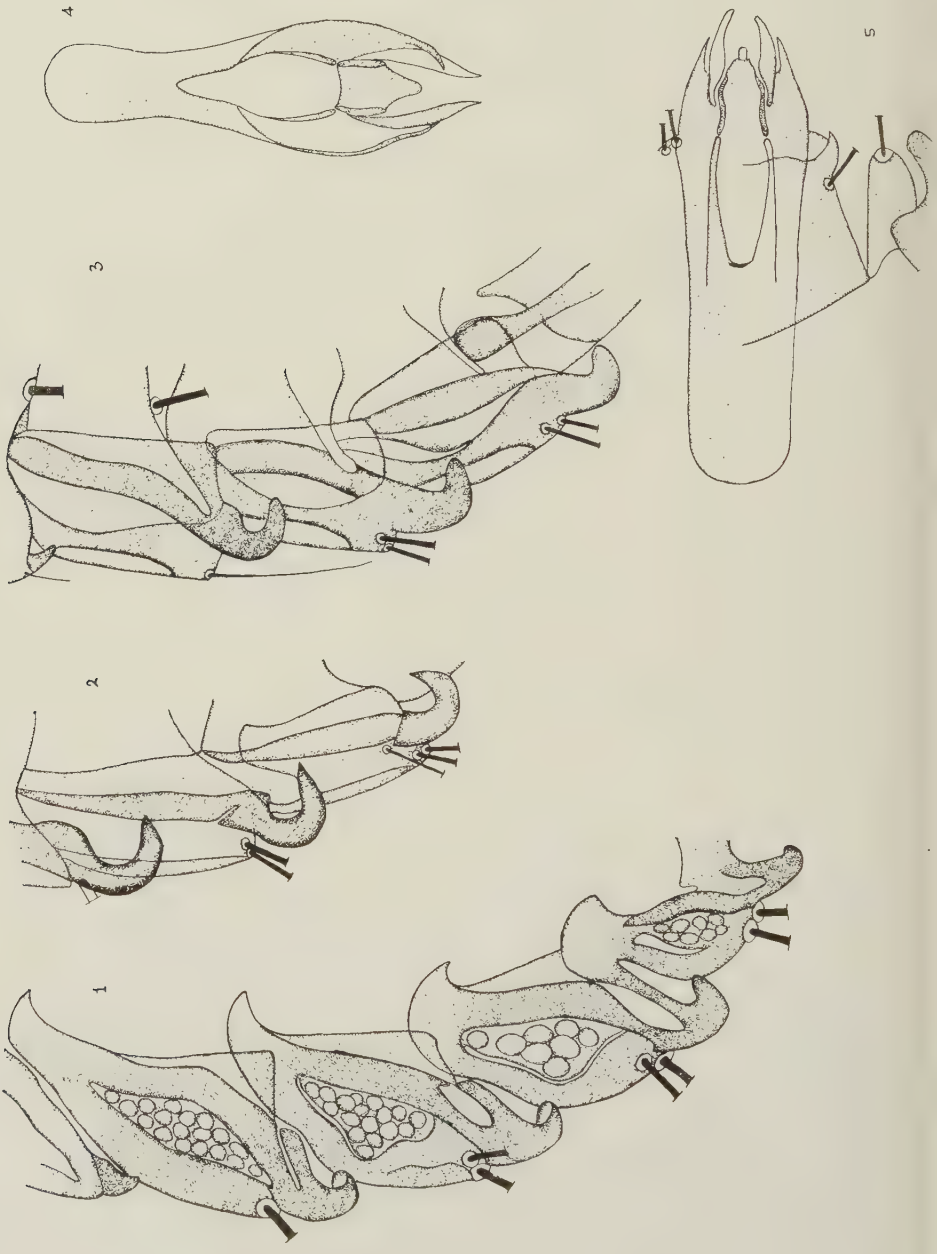


PLATE II

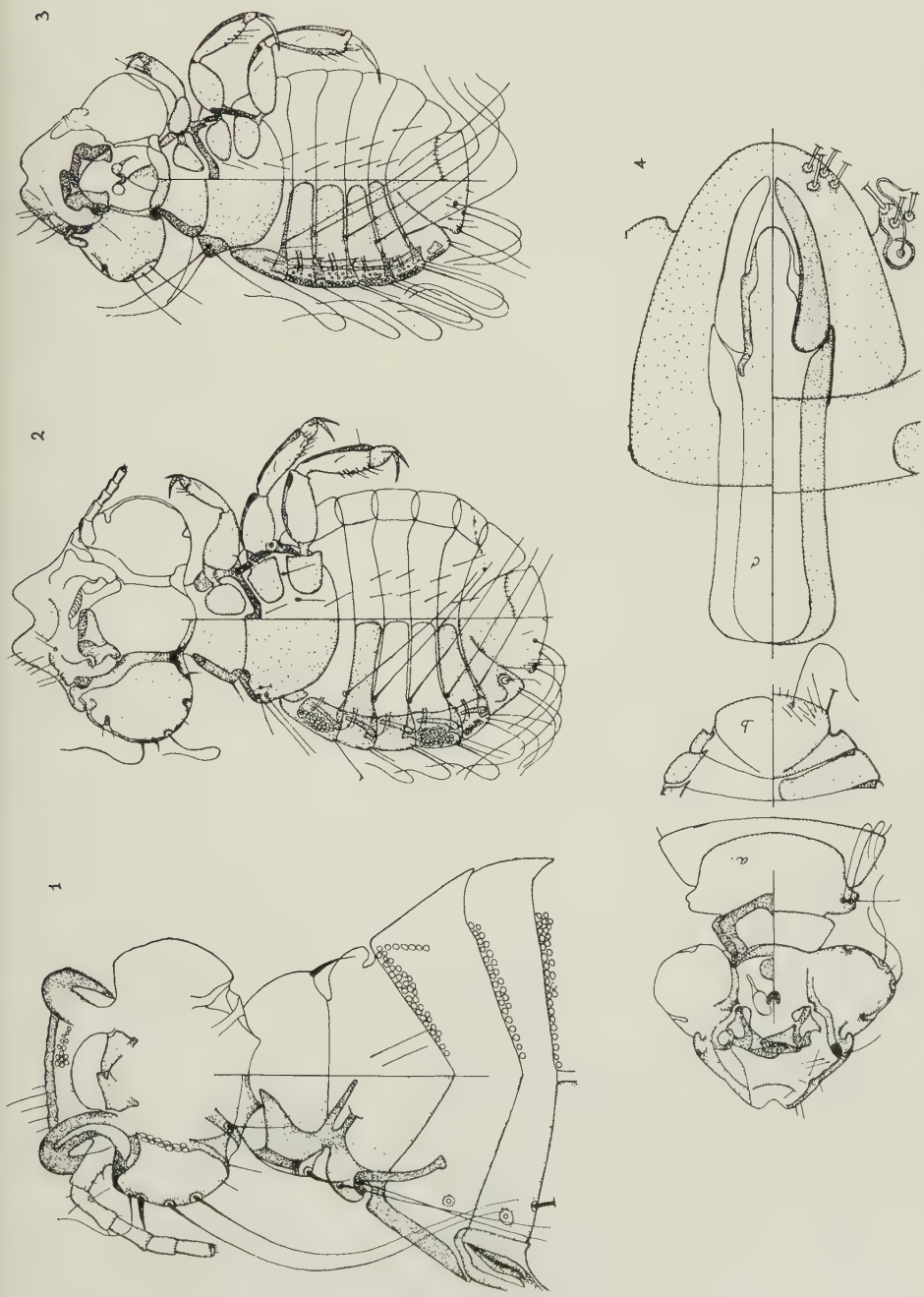


PLATE III

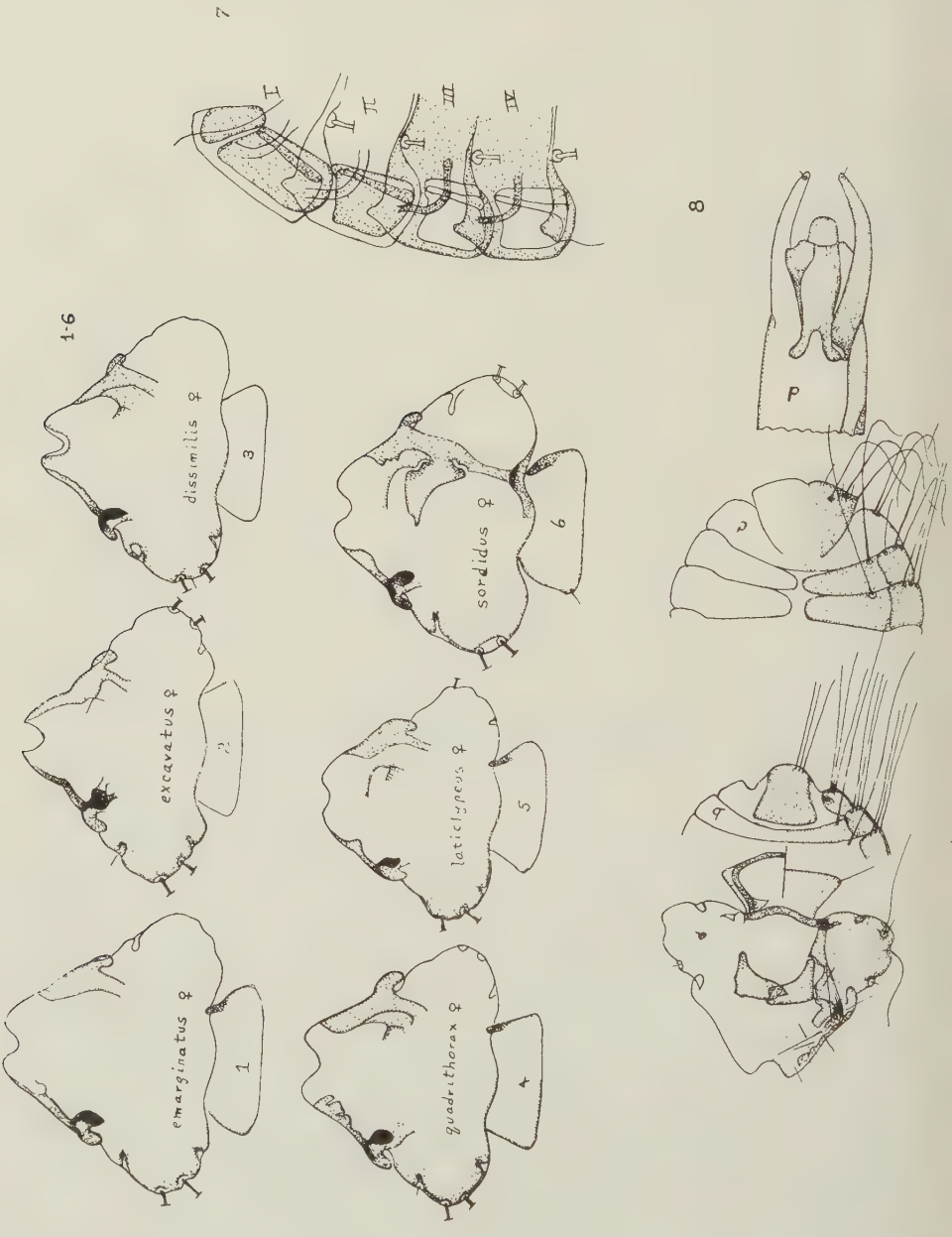
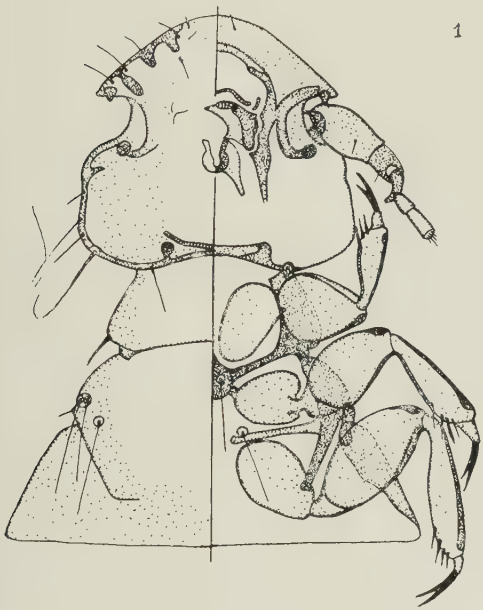
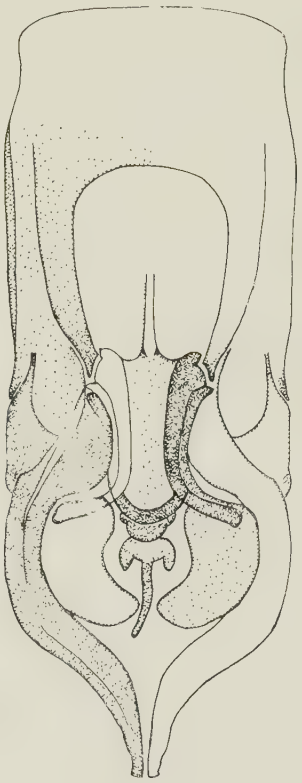
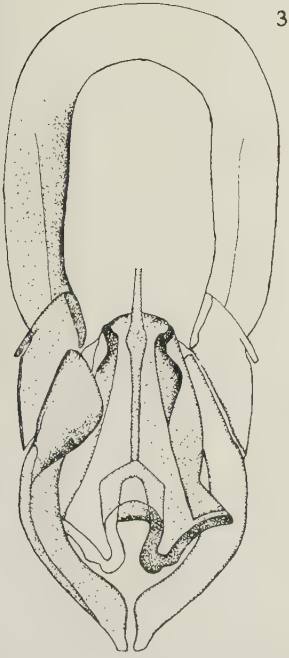

7
I
II
III
IV
8
P
1-6
dissimilis ♀
3
excavatus ♀
2
emarginatus ♀
1
sordidus ♀
6
laticlypeus ♀
5
quadrithorax ♀
4

PLATE IV







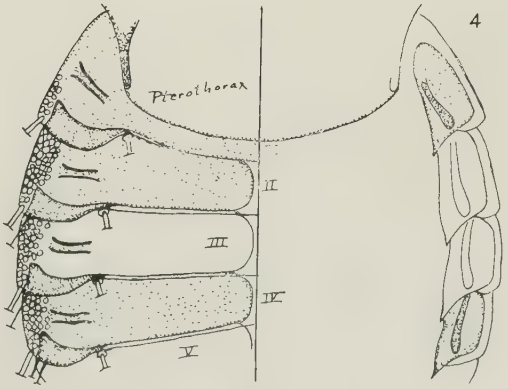


PLATE V

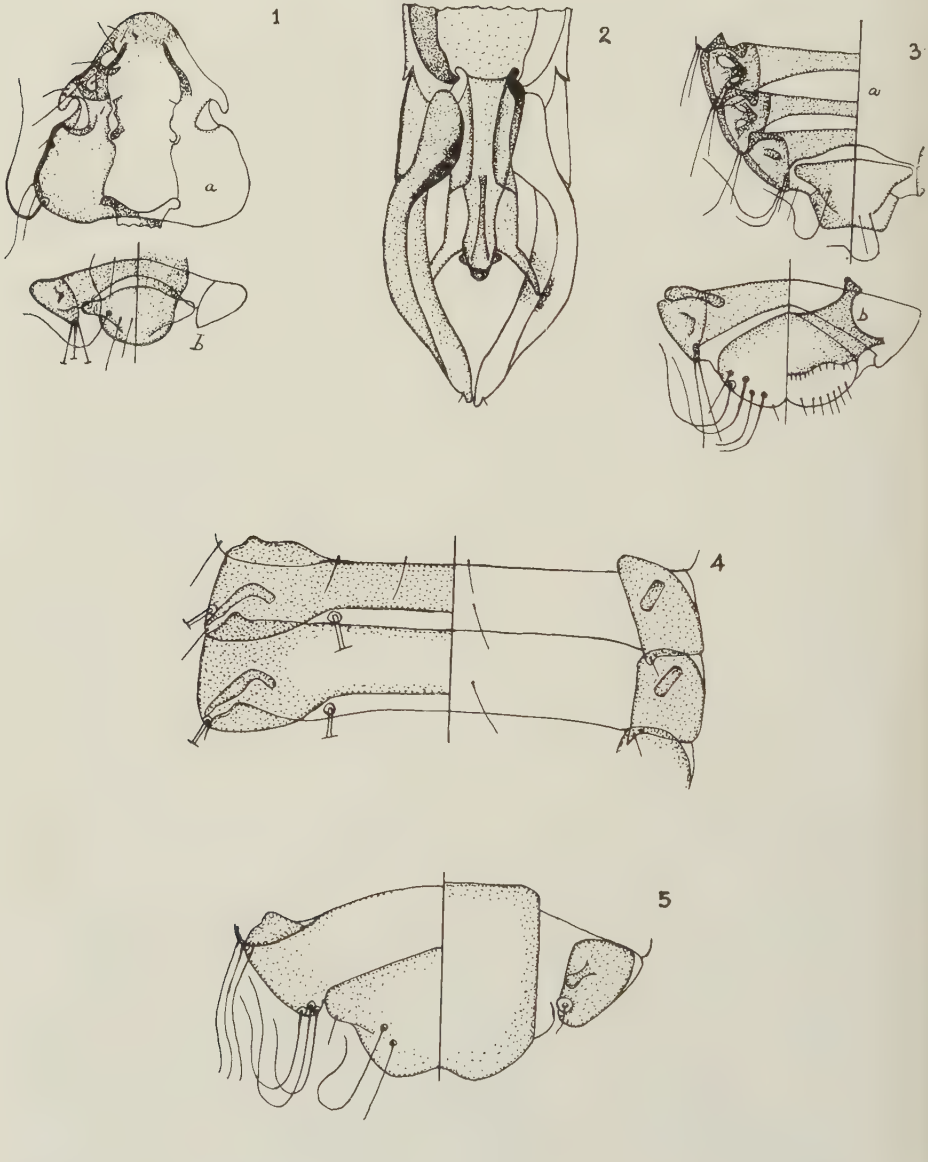


PLATE VI

A CORRECTED LIST OF THE VENEZUELAN MALLOPHAGA PUBLISHED BY

E. W STAFFORD, 1943. (1)

by

M. A. Carriker, Jr.

Resumen

CORRECCIONES A LA LISTA DE LOS MALLOPHAGA DE VENEZUELA PUBLICADA POR E. W.Stafford *EN 1943.*—El autor hace referencia a la lista citada en el título y comenta los errores que encontró tanto en las etiquetas de las láminas de los ejemplares como en las identificaciones. Revisa detalladamente las especies citadas por Stafford y hace observaciones acerca de la identidad de las mismas y de sus respectivos huéspedes. Describe como nuevas para la ciencia las siguientes especies: *Holomenopon dendrocygni* (*Austromenopon leucoxanthum* (Nit.) de Stafford); *Myrsidea psittaci; Myrsidea picta* (*C. mirabile* (Carriker) de Stafford); *Cuculiphilus fasciativentris* (*C. fasciatus* (Scopoli) de Stafford); y *Columbicola gracilicapitis* (*C. columbae* (L.) de Stafford).

When I first checked over this list I saw that it contained many errors, both as to the identification of the parasites and also of their respective hosts, the latter due both to straggling and to errors in labeling. Not wishing to see the host records for the Mallophaga furthered burdened with inexcusable errors, I wrote to Dr. Pablo Anduze (at that time editor of the Boletin) and asked him if it would be possible for me to check over the collection and try and correct some of the errors contained in the list. He replied that he would be very glad to have me do so, and forwarded to me the collection.

Unfortunately I found the slides in a sad state. Apparently the flood which had severely damaged the offices of the Department

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(1) Bol. de Ent. Venezolana, Vol. II, Nº 1, March 31, 1943, pp. 35 - 58.

of Hygiene in Caracas had also taken its toll of the box of slides. Many of the labels had become loosened due to the wetting and were scattered about so that it was a long, tedious task to replace them on the proper slides, a task which was finally accomplished with the assistance of STAFFORD's list.

Most of the specimens had been insufficiently cleared, some not at all, and I was heartily disgusted with the whole situation. Before making much headway with the work of checking the identifications I was forced to set it aside on account of my field work in Colombia for the Smithsonian Institution, and it is only recently that I have been able to again take up this work and complete it.

Many slides were missing from the collection, while none of the types had been returned, all presumably having been retained by STAFFORD, but fortunately there were paratypes of all of the species described as new, but quite a number of species which had been listed and which were represented by but one or two specimens were also retained, so that their identity could not be checked. These have been noted in their proper place.

Five of the six species which were described prove to be new, one is an immature of another species described in the same paper, while his redescription of *Menopon cracis* GIEBEL from *Crax nigra* was wholly unwarranted, since that is not the type host for the species. Seven species contained in the list are missing from the collection so that they cannot be checked, but it is obvious that most of them were incorrectly identified.

Out of 17 species which were identified by STAFFORD, and of which specimens are still in the collection, only *two* are *correctly* named, while the hosts of quite a number were in error, including two of the new species. Fortunately, by careful checking of hosts, with dates of collection and additional assistance from Dr. ANDUZE, almost all of the species have been allocated to their proper hosts.

Seven species were listed as synonyms, of which *six* are now recognized by competent authority, as being distinct, valid species.

There is no excuse for the publication of such utterly useles rubbish, since it only adds more confusion to that in which the unfortunate Mallophaga have been swamped for so long, and from which they are now emerging, thanks to the tireless work of a number of our modern workers on this fascinating group of insects.

My principal object in undertaking this unwelcome task and the publication of the results of the same, was the hope that many beginning students of Mallophaga would read it, take it to heart, and not have their own maiden efforts be criticized as ruthlessly as this one has been.

All measurements are in millimeters, made with eye-piece micrometer, and all figures made by the author.

FAMILY **MENOPONIDAE**

Holomenopon dendrocygni new species.

Figs. 1 and 2.

Type, male adult, from *Dendrocygna viduata* (LINNÉ), collected at Flores Moradas, Guarico, Venezuela, Nov. 18, 1938.

Austromenopon leucoxanthum (NIT.) of Stafford's List, p. 36.

Diagnosis.—The species resembles, somewhat superficially, *H. cairinae* EICHLER, from *Cairina moschata*, but is smaller, with both head and thorax of different shape; ocular and occipital blotches larger and more deeply colored; pleurites and tergites more strongly chitinized, and male genitalia decidedly different.

The labial palpi are unusually small, almost obsolete, and very difficult to observe, and are, apparently of generic significance, since other species of this genus in my collection, also from ducks, have more or less the same style of palpi.

The head structure is very peculiar, as may be seen from figure, and some of the details are not clear, due largely to the insufficiency of the clearing of the type. Especially may be noted the very small palpi; the perforated sclerite lying forward of the gular plate, and the large, heavily chitinized ventral sclerites lying on each side of the gular plate and to which the prothorax is attached. These characters alone are sufficient for the recognition of the

Figure 1.

Holomenopon dendrocygni n. sp. ♂.

Figure 2.

Holomenopon dendrocygni n. sp. ♂ genitalia.

species. The pleurites are almost wholly on the sternal side of the abdomen and bear peculiarly shaped incrassations, the exact shape of which are not clear. The tergites are continuous across the abdomen and heavily chitinized. It is not possible to determine the exact character of the sternites, but apparently they are also continuous from pleurite to pleurite. The chaetotaxy is rather sparse and none of the setae abnormally long, while there are

many short, stout setae on the abdomen both dorsally and ventrally, the latter being the more thickened.

Measurements of the type:

	length	width
Body	1.77	—
Head (at temples)	.36	.61
Prothorax	.26	.467
Pterothorax	.24	.55
Abdomen	1.07	.75
Basal plate	.28	.12
Paramers	.135	.105

Endomeral sac, if present, invisible.

Cracimenopon s. spinigaster (CARRIKER)

Amyrsidea s. spinigaster CARRIKER, Rev. Acad. Colombiana de Ciencias, vol VII, p. 497, figs. 18-21 (Host: *Crax nigra* (LINNÉ).

Cracimenopon s. spinigaster (CARRIKER), CARRIKER, Novitates Colombianas, Vol. I, N° 1 (in press).

Menopon cracis GIEBEL, of STAFFORD list, p. 36 (same host).

The species was originally described (1950) under the genus *Amyrsidea*, but all species described by the author from the family Cracidae and originally placed in that genus, will now be allocated to the genus *Cracimenopon*, which was erected to receive this group of Menoponidae. STAFFORD's redescription of these specimens as *Menopon cracis* GIEBEL, from an entirely different species of *Crax*, was a most unwarranted procedure.

Menacanthus cornuceps anduzei CARRIKER

Menacanthus cornutus anduzei CARRIKER, 1946, Rev. Acad. Colomb. de Ciencias, VII, p. 120, figs. 13, 14 (Host.: *Crax nigra* (LINNÉ).

Menacanthus ortalidis (CARRIKER), STAFFORD list, p. 39.

NOTE.—*Menacanthus c. cornutus* CARRIKER, 1946, of which this is a subspecies, is preocupied by *M. cornutus* SCHOMMER, 1913, and has been renamed *M. cornuceps* HOPKINS, 1950, Ann. & Mag. Nat. Hist. (12), 3, p. 241. All forms described by the author as subspecies of *M. cornutus* CARRIKER become subspecies of *M. cornuceps* HOPKINS.

Myrsidea rustica dissimile (Kellog), 1896.

Menopon dissimile Kellogg, Proc. Cal. Acad. Sci. (2), 6, p. 536, pl. 73, fig. 5 (Host: *Progne s. subis* (Linné).

Myrsidea rustica (Giebel) of Stafford, p. 40 (Host: "hirundinid bird").

There are 2 ♂♂ and 2 ♀♀ of this species in the Stafford collection, from a bird collected at San Felipe, Yaracuy. I have compared them with a good series of specimens from *Progne tapera*, *P. chalybea*, *P. chalybea domestica*, and *P. fusca*. All of these specimens are undoubtably the same thing. They differ but slightly among themselves in measurements, nothing beyond normal individual variation, all agree closely with *M. dissimile* (Kellog), from *Progne subis subis*. The form is undoubtably conspecific with *M. rustica* (Giebel), of which I possess a neoparatype female, but they are much larger than *rustica*, and differ in other ways. A single female from *Hirundo erythrogaster*, collected by the author in Colombia, is inseparable from the *neoparatype* of *M. rustica* (Giebel).

There is no doubt but what the "hirundinid bird" of Stafford is either *Progne chalybea* or *P. tapera*, very likely the former, which has a glossy steel-blue back and is common in the region of San Felipe. I have good series of *Myrsidea* (type of *rustica*) from species of *Stelgidopteryx*, *Orochelidon*, *Tachycineta*, *Atticora* and *Neochelidon*. These represent various species, possibly none of which are conspecific with *rustica*, and will be treated in a subsequent paper.

Dennyus (2) similis Carriker, 1954.

Proc. U. S. Nat. Mus., 1954 (paper now in press) (Host: "Blue Swift").

The types of this species were taken by Dr. Pablo Anduze from a bird collected by him at Barinas, Venezuela, Jan. 14, 1943, and which he called provisionally "Blue Swift". The skin of this bird dissapeared in some unaccountable manner and its true identity has since been in doubt. Dr. Anduze gave me as clear a description of it as he could recollect, but no Swift could be found which answered to this description. He also stated that

(2) There is no mention of any specimens of *Dennyus* in the Stafford list, and the specimens were labelled "*Dennyus dubius*".

it was nesting in the thatch roof of the houses of the town, which fact seems most improbable for any species of Swift.

I have just noticed that one pair of the *Myrsidea dissimile*, treated above, was from a bird taken at Barinas, on Jan. 14, 1943, while the other pair is from a bird taken at San Felipe, May 17, 1938. All four of these *Myrsidea* are exactly the same, and undoubtably came from the same host species. It has occurred to me that here we have the answer to the problem of the identity of the "Blue Swift", host for *Dennyus similis*, which was also collected at Barinas on January 14, 1943.

It is true that there are no authentic, published records (that I have seen) of the occurrence of *Dennyus* on any Swallow, but until I can secure more adequate proof that their host was actually a "Swift", I must accept *Progne chalybea* as the host of *D. similis*.

Myrsidea diffusa (KELLOG)

STAFFORD report, p. 40. He says "5 ♂♂ and 8 ♀♀ from *Amazona ochrocephala*, Urama, Carabobo, March 23, 1938".

It is very unusual to find *Myrsidea* on any species of parrot, but in my own collection I do have specimens labelled as being from *Aratinga aurea*, *Pionus menstruus* and *Amazona amazonica*. There are seven specimens from the *Aratinga*, two ♂♂ from *Amazona* and one ♂ from *Pionus*. I have previously, without careful consideration, considered all specimens of *Myrsidea*, supposedly from parrots, as stragglers, but in view of the specimens examined I must reconsider that theory. The single specimen from *Pionus* might easily be a straggler, even the 2 ♂♂ from *Amazona*, but the taking of seven specimens from a single parrot requires more careful consideration.

Of the 13 specimens of *Myrsidea* recorded by STAFFORD from *Amazona ochrocephala*, but a single pair (♂♀) were in the collection when received by me. A comparison of this pair with the specimens in my own collection from parrots reveals the fact that *all* are of the same type of *Myrsidea*, possibly all conspecific but not subspecifically the same. In view of this evidence I am forced to consider that the various species of parrots listed above

are the true hosts of the respective parasites of the genus *Myrsidea*. The pair from *Amazona ochrocephala*, recorded by STAFFORD as being *M. diffusa* (KELLOG) have a slight superficial resemblance to that species, but decidedly are not *diffusa*, and are described below.

Myrsidea psittaci new species.

Figs. 3 and 4.

Types, male and female adults, from *Amazona o. ochrocephala* (GMELIN), collected at Urama, Carabobo, Venezuela, March 23, 1938.

Diagnosis.—A small species, with circular *frons*, rounded temples, well developed ocular blotches and gular plate; head at

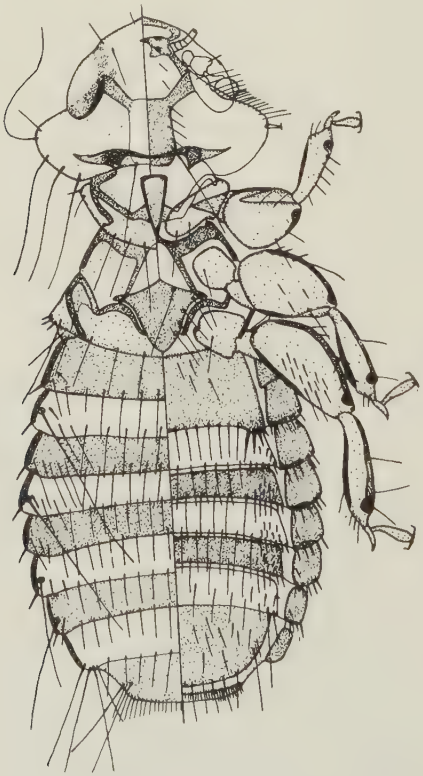

Figure 3.

Myrsidea psittaci n. sp. ♀.

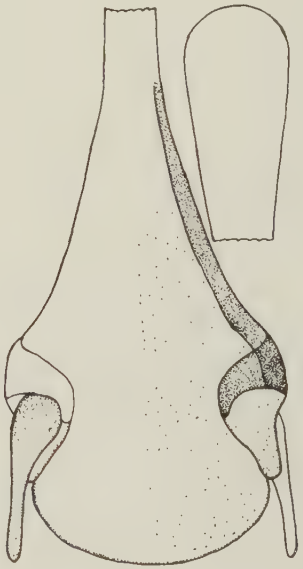

Figure 4.

Myrsidea psittaci n. sp. ♂ genitalia.

temples wider than thorax, almost as wide as abdomen; characteristic pro-and mesosternum; meso-metathoracic suture prominent; pleurites heavily chitinized; tergites continuous across abdomen, but separated from pleurites; slight sexual dimorphism in structure of abdominal sternites, I and II in the female being fused into a single plate.

Male genital armature unusually large, being (together with basal plate) almost as long as the entire abdomen, extending from middle of segment II to tip of IX.

Femora and tibiae with wide lateral bands, more deeply colored on inner side, and with a rounded, deeply colored incrassation at outer distal end. General chaetotaxy normal for genus.

Measurements of the types:

	♂ length	♂ width	♀ length	♀ width
Body	1.26	—	1.56	—
Head *frons*	—	.358	—	.40
Head temples	.33	.50	.36	.54
Head occiput	.31	—	.33	—
Prothorax	.185	.326	.185	.355
Meso-metathorax	.315	.40	.37	.525
Abdomen	.63	.53	.71	.705
Basal plate	.41	.153		
Paramers	.09	.14		
Endomeral sac	.11	.14		

Myrsidea incerta (KELLOG)

STAFFORD report, p. 40.

Two specimens were listed under this species, a ♂ from *Richmondena phoenicea* and a ♀ from *Mimus gilvus melanoptera*, and both are still in the collection.

M. incerta (KELL.) is very likely a composite species and the female is figured. The material examined by KELLOG most likely consisted of two closely related species (or subspecies, perhaps) of *Myrsidea*. It is hardly likely that two hosts so distantly related would harbor the same species of Mallophaga.

The ♀ in the STAFFORD collection from *Mimus* is in good condition for comparison, and it certainly is not the species described by KELLOG as *incerta*, but with only a single female, which might even be a straggler, I would not attempt to identify or describe it.

The single male from *Richmondena* is in poor condition, and could not be described or figured in any case, but it too, is clearly not *M. incerta* (KELLOG). There are many forms of this type of *Myrsidea* which are very similiar superficially and to properly classify them good series of well-prepared specimens, and a tremendous amount of labor are required.

Myrsidea picta new species.

Figs. 5 and 6.

Types, male and female adults, from *Cacicus c. cela* (LINNÉ), collected by PABLO J. ANDUZE at San Felipe, Yaracuy, Venezuela, May 18, 1938.

Myrsidea mirabile (CARRIKER), of STAFFORD list, p. 41.

These are two of the five specimens listed by STAFFORD, the other three were probably retained by him. There is a superficial resemblance between this species and *mirabilis*, but this resemblance is merely generic, while there is a great resemblance between all *Myrsidea* from the Icteridae, especially the Neotropical species.

The present species differs from *mirabilis* in the shape of the head; the asters of spines on abdomen contain but *five*, instead of *seven*; pleurite I, which bears the asters of spines, is much longer in the new species, reaching to the posterior margin of tergite II, while in *mirabilis* it extends only to the middle. There are many other differences, especially in the chaetotaxy.

Diagnosis.—The insect is beautifully marked with pitchy black and dark brown on a clear background, resembling the style of coloration of the species of *Brüelia* found on the Icteridae. The pre-antennary margin of the head is almost circular, with a slight indication of median angle; temples circular and broadly expanded, with occiput deeply emarginate; ocular and occipital blotches and tips of mandibles pitch-black, as well as the bands on thorax and pleurites. The abdominal structure is strongly dimorphic sexually, the female with sternite I wide and with posterior

Figure 5.

Myrsidea picta n. sp. ♀

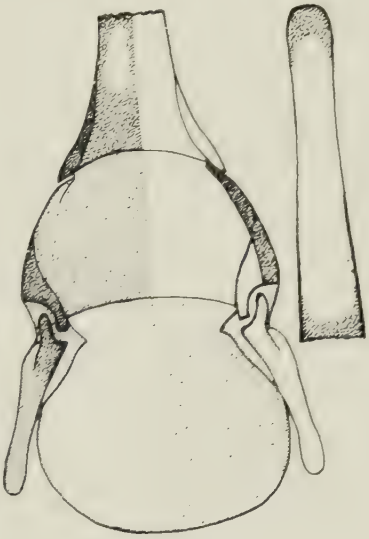

Figure 6.

Myrsidea picta n. sp. ♂ genitalia.

margin but slightly concave; sternites III to VI narrow, deep brown in color, and with a large sternal plate covering VII, VIII and half of IX, this plate with a strongly convex anterior margin, with sternites V and VI also strongly arched; all sternites separated from pleurites by a wide clear area.

In the male, sternite I has a strongly concave posterior margin, with protruding lateral angles which bear the spines, the tips of these rounded angles reaching to the posterior margin of tergite II. Sternites III to VII are narrow and of uniform width, with

a large sternite covering most of IX, all of VIII and posterior portion of VII.

The male genitalia are very large, both basal plate and endomeral sac, with straight paramers (see fig.). The figure will fully illustrate the chaetotaxy and the remaining details of structure which have not been touched upon.

Measurements of the types:

		♂ length	♂ width	♀ length	♀ width
Body		1.48	—	1.735	—
Head	*frons*	—	.337	—	.358
	temples	.347	.50	.375	.525
	occiput	.314	—	.347	—
Prothorax		.185	.325	.185	.358
Pterothorax		.282	.456	.345	.586
Abdomen		.76	.553	.89	.70
Basal plate		.41	.148		
Paramers		.11	.13 (at base)		
Endomeral sac		.12	.14		

Myrsidea magnidens Stafford

Bol. Ent. Venez., Vol. II, N° 1, Mar 31, 1943, p. 43, figs. 10-17 (Host: *Pitangus sulphuratus rufipennis* (Lafresnaye).

The species was described from 2 ♂♂, 2 ♀♀ and 1 nymph. 1 ♂, 1 ♀ and the nymph (paratypes) remain in the collection, the types having been retained by Stafford.

These specimens are in very bad condition, never having been cleared, and it is impossible to check on details. The species can possibly be recognized from the description and figures, although the latter, like most of his figures are very poor.

It is of the same type as *M. incerta* (Kellogg), a type of *Myrsidea* found on many passerine birds.

Eureum cimicodes Nit. in Burm.

Stafford list p. 43.

A female is recorded from "hirundinid bird" ("California Swift"), Rancho Grande, Aragua, Dec. 1937. This specimen doubtless was kept by Stafford, since it is not in the collection.

Just what the species really was, or what its host may have been, are all very problematical, possibly it was not *Eureum*.

Trinoton aculeatum Piaget.

Stafford list, p. 43. 1 ♀ from *Dendrocygna viduata*, Flores Moradas, Guarico, Feb. 18, 1938.

This specimen is also missing from the collection. The identification of this species is doubtless correct, since *D. viduata* is the type host for *T. aculeatum* Piaget.

Colpocephalum burmeisteri Kellogg.

Stafford list, p. 43. One ♂ from *Amazona ochrocephala*, Urama, Carabobo, Mar. 25, 1938.

This specimen is not in the collection, but it is absolutely certain that it is not *C. burmeisteri* Kellogg, the host for that species being *Ara chloroptera*, and I have yet to see the same species of Menoponidae on two hosts so dissimilar. It would be easily determined if the specimen were available, since in my own collection are specimens of *C. burmeisteri* from the type host. This species has been placed in the genus *Psittacomenopon* by Hopkins and Clay, but it cannot remain there. A complete revision of the entire group of Menoponidae from neotropical Psittacidae must be made.

Colpocephalum anduzei Stafford

Bol. Ent. Venez., Vol. II, N° 1, Mar. 31, 1943, p. 43, figs. 18-28. [Host: *Aratinga pertinax* = *A. pertinax aeruginosa* (Linné).].

The description and figure are possiby sufficient to enable the species to be identified, providing it is from the same host. There are many closely related species of this group of Menoponidae on the parrots, and they require very accurate figures, measurements and description for their separation. There are now 9 ♂♂ and 9 ♀♀ paratypes of the species in the collection.

This species, like the preceeding one, is not a *Colpocephalum*, neither is it a *Psittacomenopon*. The note under *C. burmeisteri* also applies to this species.

There are also in the collection, among the slides labelled by STAFFORD as *C. anduzei*, four slides containing 11 ♀ ♀ of another species and genus of Menoponidae. In my own collection are a number of species of this type, the head of which resembles that of *Eomenopon*, but they lack the head-spines of that species.

Kurodaia sp.

There is a ♂ and ♀ of this genus with no host label attached, the label probably having been dislodged from the wetting suffered by the collection. There is no hawk or owl listed from which these specimen could have been taken. There is also a single ♀ of a *Degeeriella* (type of) *fusca*, and was thus labelled, but the label containing the name of the host is also missing. *Degeeriella fusca* does not appear in STAFFORD's list.

It is possible that the pair of *Kurodaia* came from the same host as the *D. fusca*, but there is no possible way of determining the identity of this bird, so the specimens should be discarded.

Cuculiphilus fasciativentris new species.

Figs. 7 and 8.

Types, male and female adults, from *Piaya cayana mehleri* BONAPARTE, collected at Borburata, Carabobo, Venezuela, Dec. 24, 1937.

Cuculiphilus fasciatus (SCOPOLI), STAFFORD list, p. 49.

Diagnosis.—This is a typical *Cuculiphilus*. There are only six known species of the genus from the family Cuculidae (1), of which four are from hosts found either in southwestern Asia or Europe. The remaining two, *C. decoratus* (KELL.) and *snodgrassi* (KELL. & KUW.) are from *Coccyzus americanus* and *C. melanocoryphus*.

I have compared these two parasites with specimens of *C. decoratus*, from which they differ markedly, and they are also very different from *snodgrassi*, according to the description and figure of that species. I also have an undescribed species of this genus

(1) I do not consider that species from vultures, placed in this genus by HOPKIN and CLAY, are congeneric with *Cuculiphilus fasciatus* (SCOPOLI), but should be placed in the genus *Falcophilus* GUIMARAES.

Figure 7.

Cuculiphilus fasciativentris n. sp. ♀.

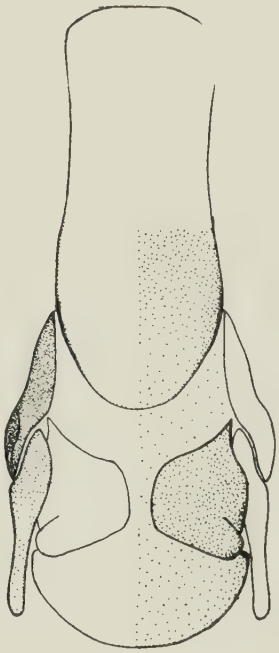

Figure 8.

Cuculiphilus fasciativentris n. sp. ♂ genitalia.

from *Coccyzus erythropthalmus*, which resembles *decoratus* and is also quite different from the new form from *Piaya*, here described.

The new species here described is typical of the genus, with flatly convex *frons*, temples circular and strongly expanded both laterally and posteriorly (width of head nearly twice the length at occiput), with well-marked preocular slit. The ocular blotches are very large, as well as those on the occipital margin, both are pitchy black and connected by a broad band of dark brown. There is a conspicuous dark brown band across tergite II in both sexes, and with a deeply colored transverse band across median portion

of pleurites IV to VII in the female and I to VIII in the male, also a broad, curving, deeply colored band across anterior margin of pterothorax. The femora and tibiae are bordered on both sides by conspicuous darker bands, and there is a deeply colored, round incrassation at outer, distal portion of all tibiae.

The general chaetotaxy sparse, but the hairs of the head, sides of abdomen and dorsal portion of body are, in general, very long and coarse, while the setae of the ventral surface are short and finer in texture. There are four long combs of fine, short setae on the hind femora and *five* combs of the same type on each side of sternites II and III. (See fig.)

Except for smaller size (specially abdomen) the male is very similiar to the female in general shape and markings. The genitalia are very large in comparison to the size of the abdomen, but the basal plate is short and thick, the paramers very short, straight and slender, while the endomeral sac is very large, but with no complex internal sclerites or structure of any kind.

Measurements of the types:

	♂ length	♂ width	♀ length	♀ width
Body	1.24	—	1.48	—
Head *frons*	—	.445	—	.48
Head temples	.37	.575	.404	.64
Head occiput	.335	—	.35	—
Prothorax	.15	.38	.174	.40
Pterothorax	.163	.445	.163	.52
Abdomen	.695	.66	.89	.77
Basal plate	.30	.152		
Paramers	.098	.14		
Endomeral sac	.12	.135		

Osborniella crotophagae (STAFFORD).

Colpocephalum crotophagae STAFFORD, Bol. Ent. Venez., Vol. II, Nº 1, Mar. 31, 1943, p. 47, figs. 29-36 (Host: *Crotophaga ani*).

2 ♂♂ and 5 ♀♀ paratypes out of 15 specimens listed are still in the collection. It is a well marked species and is the genotype of the genus *Osborniella* THOMPSON, 1948.

Ricinus pallens (KELLOG)

Physostomum pallens KELLOGG, 1899, Occ. Pap. Cal. Acad. Sci., 6, p. 49, pl. 4, fig. 7. [Hosts: *Protonotaria citrea* (BODD.) and *Elaenia subpagana* SCL. & SALV.]

There are a pair of *Ricinus* in the collection, the ♀ being labelled "*Ricinus tenerapallens*", and the host given for both as "a hawk", collected at Barinas, Feb, 1943.

A careful comparison was made between these specimens and KELLOG's description and figure of *R. pallens*, and with specimens in my own collection which had been identified as *pallens*, and they are apparently that form. I have taken *pallens* on several species of N. A. Warblers, also on *Parula pitiayumi*, and I believe that its type is correctly given as *Protonotaria citrea*, but I am very doubtful of KELLOG's other host reference, *Elaenia subpagana*. This pair of *Ricinus* in the collection does not appear in STAFFORD's list. There is no way of ascertaining their true host, but I am confident that it was some migrant species of N. A. Warbler, and the date of collection would bear out that theory.

R. pallens (KELLOG) is also very closely related to *R. picturatus* (CARRIKER), taken on *Vermivora celata*, and at best, I think that the two are conspecific, while sufficient material may prove them to be inseparable.

ISCHNOCERA

Cebidicola semiarmata (NEUMANN)

STAFFORD list, p. 50. A single female from *Aluata ursina*.

This specimen is not in the collection, but there are a ♂ and ♀ labelled as *Heterodoxus spiniger* (ENDERLEIN), (Host: Dog), which do not appear in the published list. Since I have not studied this group of parasites, I cannot check on the correctness of the identification. However, in the new List by HOPKINS and CLAY, the correct name for the only species of *Heterodoxus* found on *Canis familiaris* LINNÉ, is *spiniger* (ENDERLEIN).

Philopterus agelaii (OSBORN).

STAFFORD list, p. 50. Two ♀♀ from *Sturnella magna*, Colonia Tovar, Aragua, Jan. 1939.

One of these females is still in the collection. I have compared it with a ♀ of *agelaii* from the type host collected at Lincoln, Neb., and it is *not* that species, although I must say that there is a strong superficial resemblance. No *Philopterus* has been described from a species of *Sturnella*, and all published records of that genus from *Sturnella* have been called "*subflavescens*", a species which does not exist. This parasite from *Sturnella* is undoubtedly without a name, but from a single female, in poor condition, I do not wish to describe it.

Philopterus sp.

STAFFORD list, p. 50. One ♀ and 2 nymphs from *Amazona ochrocephala*, collected at Urama, Carabobo.

One of the nymphs remains in the collection. These specimens were either incorrectly labelled or were stragglers, preferably the former, since *Philopterus* rarely straggles from one dead bird to another. The genus *Philopterus* is *not* found on the family Psittacidae.

Philopterus domesticus (KELLOGG), 1896.

Docophorus domesticus KELLOGG, Proc. Cal. Acad. Sci. (2) 6, p. 475, pl. 65, fig. 4 (Host: *Progne s. subis*). STAFFORD report, p. 50. Three ♂♂ from a hirundinid bird, *golondrina* (Swallow), San Felipe, Yaracuy, May 17, 1938."

There remains in the collection 1 slide of this species, containing an adult ♂ and a nymph. On left end of slide is a label bearing the following: "Golondrina, San Felipe, May 17, 1938. On the other end the label says: "*Philop. domesticus* ♀, Misc. Birds, Barinas, January 1943." This discrepancy in labels may be due to the fact that many labels were detached from the slides on account of the wetting suffered by the box at some time prior to its shipment to me, and in sorting out these labels and attaching them again to their proper slides, an error may have been made.

However, in STAFFORD's list there is no mention of any specimen of *Philopterus domesticus* ♀, from Barinas, while the adult louse mounted on this slide is a ♂.

I have compared this male with KELLOGG's description and figure of *P. domesticus*, and with a male in my own collection taken on *Progne tapera* in Colombia, and there are no discernible differences between the three.

This record further corroborates the supposition that the host of *Myrsidea rustica dissimile* was also *Progne chalybea*, since the so-called "hirundinid bird" on which it was taken was collected at San Felipe on the same day, and was most likely the same bird. Without a direct comparison with material from *Progne subis* (which I do not have) it is impossible to determine whether or not there might be subspecific differences, but I doubt very much if they will be found to differ.

Austrophilopterus sulcatus CARRIKER, 1950.

Rev. Brasil. de Biologia, 1950, vol. 10, p. 187. (Host: *Aulocorhynchus s. sulcatus* (SWAINSON). *Austrophilopterus cancellosus* (CARRIKER), STAFFORD's list, p. 51 (Host: *Aulocorhynchus s. sulcatus*, Colonia Tovar, Jan. 1939.).

There was no excuse for this error, since the present species does not resemble in the least *A. cancellosus*, except that it is the same genus.

Quadraceps semifissa mexicanus CARRIKER, 1944.

Bol. Ent. Venez., 3, p. 99, pl. 5, figs. 8-9. [Host.: *Himantopus h. mexicanus* (MULLER)]; *"Quadraceps" signata* (PIAGET), Les Pediculines, p. 186. STAFFORD's list, p. 51. (Host: *Himantopus h. mexicanus*, Ocumare de la Costa, Jan. 15, 1933.

There is a certain resemblance between *semifissa* and *signata*, but the genitalia are very different, so that there was not much excuse for this error.

Bizzarifrons sp.

STAFFORD's list, p. 51. Two immature females from *Cacicus c. cela*, San Felipe, May 18, 1938.

There is one slide in the collection containing an immature *Philopterus* which is labeled *"Bizzarifrons* sp. juvenile specimen".

(Host: "Arrendajo" =*Cacicus c. cela*, San Felipe, May, 18, 1938.) This louse is a typical *Philopterus*, and there is no parasite of that genus known from this host. It is probably a new species, but since it is an immature specimen it would be useless to attempt a description of it.

Vernoniella macgregori (KELLOGG), 1899.

Lipeurus macgregori KELLOGG, Cal. Acad. Sci. Occ. Papers VI, p. 33, pl. 3, figs. 5 and 6. (Host: *Crotophaga sulcirostris*); *Vernonia macgregori* (KELLOGG) of STAFFORD'S list, p. 51. One ♂ from *Crotophaga ani*, San Felipe, May 18, 1938.

There is no specimen of this species in the collection, doubtless it was kept by Stafford. It may, or may not, be *macgregori*, since the host of that species is *C. sulceirostris*, not. *C. ani*.

Columbicola gracilicapitis new species.

Figs. 9 and 10.

Types, male and female adults, from *Leptotila v. verreauxi* (BONAPARTE), the ♂ holotype from bird collected by the author at Tarazá, Antioquia, Colombia, April 26, 1948; the ♀ allotype from bird of same host collected at San Felipe, Venezuela, May 18, 1938 (in the STAFFORD collection). (♂ holotype in coll. U. S. Nat. Mus.).

Columbicola columbae (LINNÉ), STAFFORD list, p. 52. Two ♀♀ from *Leptotila v. verreauxi*.

There remains in the collection a single ♀, rather badly mutilated (in mounting), which I have used as the ♀ allotype for the new species.

Diagnosis.—The species may be distinguished by the very long and very narrow head, long clypeal signature; long and very heavy antennae in male; and by the peculiar "scaled" or "corrugated" appearance of the abdominal pleurites. The female has the same shape of head and clypeus, but with very slender antennae (except 1st. seg.), and also the same "scaled" pleurites. The accompanying figures will illustrate the entire structure of the species much better than a lengthy description.

Figure 9.

Columbicola gracilicapitis n. sp. ♂.

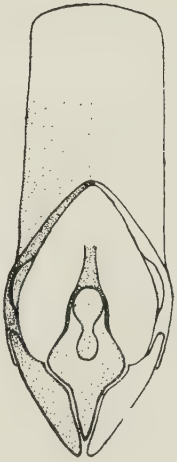

Figure 10.

Columbicola gracilicapitis n. sp. ♂ genitalia.

Measurements of the types:

	♂ length	♂ width	♀ length	♀ width
Body	2.31	—	?	—
Head	.553	.27	.586	.29
Prothorax	.163	.217	.174	.217
Pterothorax	.282	.27	.314	.28
Abdomen	1.41	.29	?	.38
Basal plate	.20	.097		
Paramers	.066	.07		
Endomera	.08	.03		

Acidoproctus rostratus (Rudow), 1866.

Ornithobius rostratus Rudow, Z. ges. Nat. Wiss., 27, p. 465. (Host: *Chenalopex aegyptiacus*, Error = *Dendrocyna viduata* (Linn.) (see Carriker, 1949, Proc. U. S. Nat. Mus. 100, p. 378).

Stafford list, p 52. Two ♂♂, one ♀ and two nymphs, from *Dendrocygna viduata*, Flores Moradas, Guarico, Feb. 18, 1938.

There remain in the collection 1 ♂ ad. and 1 ♀ juv. For redescription and figures of this species see reference above by author, 1949.

Brüelia amazonae Stafford

Bol. Ent. Venez., vol. II, N° 1, Mar. 31, 1943, p. 52, figs. 37-39. (Host: *Amazona ochrocephala*, Error = *Cacicus c. cela*), from Urama, Carabobo.

Brüelia cela Stafford, c. f. p. 53. (Host: *Cacicus c. cela*), equals immature of *B. amazonae* Stafford, described on previous page. The type of *B. cela* is not in the collection.

This species is the common type of *Brüelia* found on the Icteridae, but *never* on Psittacidae. The next species in Stafford's list is *Brüelia cela* new species, whose host is given as *Cacicus c. cela*. *B. cela* is merely an immature specimen of *B. amazonae*, which is proof positive that the correct host for *Brüelia amazonae* is *Cacicus c. cela* and not *Amazona ochrocephala*. The fact that he lists 5 ♂♂ and 2 ♀♀ of *B. amazonae* seems to show that the error was one of labelling, and not of straggling. Also, *Brüelia* is not much of a straggler, since it moves too slowly. There are three slides of *B. amazonae* in the collection, one containing 3 ♂♂.

one with 1 ♀, and the third with 1 ♂, and all labelled "paratypes", and with host given as *Amazona ochrocephala*. Urama, March 25, 1938.

Oxylipeurus penelope Clay, 1938.

P. Z. S., Lond. (B), XVIII-2, p. 185, pl. XIII, fig 2. (Host: *Penelope p. purpurascens*).

A single female is listed by Stafford, p. 54, with host as *Crax nigra*, San Felipe, May 16, 1938. This specimen is not in the collection. No *Oxylipeurus* has been described from *Crax nigra*, but it is practically certain that the specimen listed by Stafford is not *O. penelope* Clay, since other closely related species of *Crax* possess types of *Oxylipeurus* decidedly different from *O. penelope*.

Paragoniocotes sp.

Stafford list, p. 55. One ♂ from "Pyrrhula" (= *Pyrrhura) leucotis emmae*, collected at Carupano, Dec. 22, 1937.

This specimen is in the collection, but has the apical portion of the abdomen missing, together with the genitalia, which are vitally important for especific identification in this genus. It is not *venezolanus* Stafford.

Paragoniocotes venezolanus Stafford, 1943.

Bol Ent. Venez., Vol. II, N° 1, Mar. 31, 1943, p. 55, figs. 44-51. (Host: *Cacicus c. cela*).

There is no question as to the incorrectness of this host, as given by Stafford, since the genus is found *only* on Psittacidae, while on the same day that *Cacicus cela* was collected at San Felipe (May 18, 1938) a specimen of *Aratinga pertinax aeruginosa* was also collected, which was the type host for *Colpocephalum anduzei* Stafford. This also appears to haven been an error in labelling, since *Paragoniocotes* is not a very active group, with tendencies to travel from one dead host to another, like the Menoponidae. There are but two specimens of this species left in the collection, a ♂ and ♀ paratypes.

Strongylocotes interruptus caquetae Carriker

Rev Brasil de Biol. (in press). (Host: *Crypturellus v. variegatus* (Gmelin), Puerto Venecia, Caqueta, Colombia.

Strongylocotes complanatus fimbriatus Clay, of Stafford list, p. 57. (Host: "*Crypturus*" *v. variegatus*).

There are 8 ♂♂ and 5 ♀♀ listed from this host, collected at Lagunillas, Zulia, March 17, 1938. I have compared the single remaining pair of these specimens with the type series of *S. interruptus caquetae* Carriker, and find them to be the same.

This is not *S. setifer* Hopkins, 1942 (nom. nov. for *Goniodes setosus* Piaget, supposedly from this host), see Carriker, Rev. Brasil. de Biol. cited above.

Physconelloides ceratoceps Ewing.

The host for this species was *Leptotila verreauxi chlorauchenia* (Scl. & Salv.) Stafford lists on page 57 four ♀♀ of this species from "wild turtle dove, sin data".

There were no specimens of this genus in the collection when received by me. It is useless to speculate as to the identity of either the lice or their host. It may very easily have been *Leptotila v. verreauxi*, since this bird was collected and specimens of *Columbicola* taken from it (described above). If the lice did, indeed, come from that host it is very likely that they really are *P. ceratoceps* Ewing.

Stafford makes *Physconelloides mattogrossoensis* Guimaraes a synonym of *P. ceratoceps* Ewing. This is an absolute error. The host of Guimaraes' species is *Columbagallina m. minuta*, and it is a very distinct species.

Penenirmus sp.

There is in the collection a single slide containing a ♀ of *Penenirmus*, from which all labels were missing. There is nothing listed by Stafford which could possibly be this specimen. It is in good condition, but lacking all data, is worthless.

CONCERNING SALDIDAE (HEMIPTERA) OF THE WESTERN HEMISPHERE

By C. J. Drake and F. C. Hottes

Resumen

ACERCA DE LOS SALDIDAE (HEMIPTERA) DEL HEMISFERIO OCCIDENTAL.—El trabajo contiene las descripciones de cuatro especies nuevas y notas acerca de otras seis, indicando la ubicación de los tipos y da nuevas combinaciones y sinonimias. Las siguientes especies son descritas como nuevas: *Micracanthia utahensis, Ioscytus nasti, Saldula chipetae* y *S. opiparia.* Propone la nueva combinación *Ioscytus franciscana* (Drake) para *Saldula franciscana* Drake y coloca a *Salda dispersa* Uhler como sinónimo de *Saldula arenicola* (Scholtz).

This paper contains descriptions of four new species of Saldidae and notes on six other species. The location of types and information on new combinations and new synonymy are given under the various species. The left parameres of several species are figured.

Micracanthia utahensis, sp. new

Small, ovate, black; pronotum and scutellum shining; hemelytra dull, brown-back with five or six pruinose spots and flavous or pale brownish stripes on outer margins; pubescence brownish or golden, longer and more conspicuous on hemelytra. Head black, scarcely shining, with short brownish pubescence, with usual long, dark, upright hairs; ocelli yellowish brown, separated by about the distance of a diameter of one of them, with rounded, flavous spot between each ocellus and eye; front with whitish, apical ridges becoming darker inwardly, their tips not meeting within; clypeus broad, convex above, yellowish brown, one-half longer than broad; labrum mostly brownish, strongly narrowed to a point at tip; gula and bucculae black, clothed with grayish hairs. Rostrum

very long, testaceous, extending between hind coxae. Antennae moderately long, shortly pilose, with scattered, long hairs on second, third and fourth segments; segment I testaceous with fuscous spot beneath; II testaceous or brownish; III and IV black-fuscous; proportions —I, 14; II, 19; III, 14; IV, 17. Eyes very large, converging anteriorly, brown-fuscous, with large subapical notch on inner side.

Pronotum deep black, shining, moderately narrowed anteriorly, the pubescence short, brownish, rather dense, decumbent; sides moderately narrowed anteriorly, rectate, slightly reflexed; callus moderately large, convex, not extending on expanded margins, with large, deep, discal impression, sulcate down middle posteriorly behind the impression; furrow just behind callus deep, arcuate, pitted at bottom; hind lobe convex, a little shorter than callus, broadly roundly excavated behind. Scutellum subequal in length and width, indistinctly rugulose behind, deeply impressed in front of middle, the color, pubescence and lustre as on pronotum. Hemelytra black-fuscous, somewhat velvety, not shining, the pubescence longer than on pronotum, golden, not very dense, reclining posteriorly; clavus dark, with a small, rounded, subapical blueish spot; inner corium not as dark as clavus, with four prominent, pruinose spots (one marginal subbasal, one marginal median, and two smaller apical); outer corium with a subbasal and a subapical spot in the dark area, the outer margin broadly brownish; membrane considerably clouded with dark brown, non-hyaline, each of the four cells tending to become paler apically. Abdomen beneath black-fuscous, densely clothed with grayish hairs. Legs yellowish brown, clothed with short, pale hairs; tibial spines long, dark fuscous.

Length, 3.15 mm.; width, 1.50 mm.

Type (male) and two paratypes, Emery County, Utah, Sept. 21, 1920, Grace O. Wiley, in the collections of the authors.

This species resembles rather closely in size and color both *M. hungerfordi* (Hodgen) of eastern United States and *M. fennica* (Reuter) of Europe, but it is readily separated from them by the proportional lengths of the antennal segments, pruinose spots on

the hemelytra and distinctly longer pubescence. These same characters will also separate it from *M. humilis* (Say), *M. pumpila* Blatchley and *M. 4-maculata* (Champion). However, the last three species have differently colored and marked hemelytra.

Ioscytus franciscana (Drake)

Saldula franciscana Drake, Psyche, 56(4):192. 1949 (New combination.).

On account of the stout antennae, hind margin of eyes removed from pronotum and dorsal vesture of the body, this species is transferred to the genus *Ioscytus* Reuter. The female (allotype) is slightly larger than the male. One female has been examined from San Francisco and another from Corvallis, Oregon, both taken by C. J. Drake. *Franciscana* is more closely related to the new species described below than to *I. politus* (Uhler).

In addition to the difference in color and vesture, the third and fourth antennal segments are more swollen and side of pronotum more rectate in *politus*.

Ioscytus nasti, sp. new

Large, elongate-ovate, blackish, the dorsal vesture composed of brown or golden, semi-reclining pubescence and thinly scattered, erect, dark hairs. Head black, strongly declivent in front, with short, brownish pubescence, with usual long, erect, dark hairs; front shallowly longitudinally furrowed on median line, the apical ridges long, narrow, sharply raised, reddish brown, not meeting within; clypeus long, convex, reddish brown, twice as long as wide, the small callus on each side reddish brown; ocelli reddish, small, placed rather closely together; a small reddish spot on each side between each ocellus and eye. Eyes large, converging anteriorly, brown-fuscous, the inner subapical notch small, black. Rostrum light ferrugineous, paler beneath, extending between hind coxae. Antennae very stout, moderately long, shortly pilose; segment I stout, brown, mostly black beneath; II long, very stout, brown, distinctly gradually enlarged from base to apex; III and IV stout, black-fuscous, thicker than other segments and with

longer, denser pilose, also with a few scattered, dark, seta-like hairs; proportions — I, 18; II, 36; III, 24; IV, 24.

Pronotum large, trapezoidal, only moderately narrowed anteriorly, deeply and broadly excavated behind, the side margins rectate, slightly reflexed; proportions — width, at base 65, at apex 32, median length 25; pubescence rather long, decumbent, brown or golden, with a few, long, dark, erect, scattered hairs; callus large, moderately raised, convex, not extending outwardly on expanded lateral margins, very densely pubescent, with very large discal impression; furrow behind; callus deep, arcuate, pitted at bottom, covered with pubescence; hind lobe nearly as long as callus. Scutellum very black, moderately shining, subequal in width and length, mostly denuded of pubescence, very shallowly impressed before the middle. Hemelytra blackish, rather sharply narrowed and rounded apically with their tips overlapping in repose; clavus deep, black, sligtly shining, clothed with golden pubescence; corium blackish, shining, slightly embrowned apically, with some golden pubescence near clavus, otherwise almost denuded of pubescence, with some scattered, erect, long, dark hairs; embolium brownish black, slightly shining, moderately reflexed, basally darker with golden pubescence; membrane brown, darker basally, scarcely hyaline, composed of four cells. Legs testaceous, with short pale hairs; femora black beneath, with small dark spots on sides; tibiae of all legs with few scattered dark brown or black fuscous spines. Abdomen beneath dark fuscous, faintly shining, densely clothed with grayish hairs.

Length, 5.00 mm.; width, 2.00 mm.

Type, female, Goodyear Bar, Sierra Co., Calif., June 3, 1928. E. H. Nast, Calif. Acad. Sciences.

This species is most closely allied to *T. franciscana* (Drake), but it is easily distinguished by its larger size and the much stouter and longer second antennal segment; the outer margins are also straighter. In both *franciscana* and *nasti*, the pronotum is not as strongly narrowed anteriorly as in *politus* Uhler; also, the remote, long, erect hairs of dorsal surface are not as numerous and shorter.

Ioscytus politus (UHLER).

Salda politus UHLER, Bull. U. S. Geo. Surv., 3:441. 1877.

Specimens of this species have been examined from Calif., Nev., Ut., Colo., and Ariz. It is also known from N. Mex. Var. *politus flaricosta* REUTER, Ofv. Finska Vet. Soc. Forh., III, Ofd. A. (12), p. 21, 1912, has the outer corium flavous instead of largely jet-black as in the typical form.

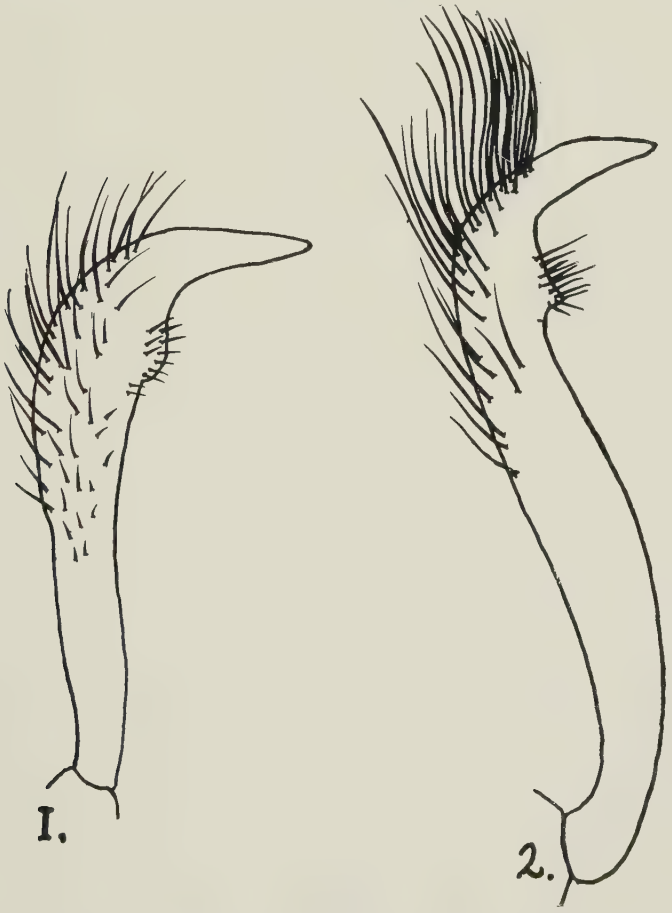

Figure 1.
Right paramere *Ioscytus politus* (UHLER). Specimen from Utah.
Figure 2.
Right paramere *Saldula arenicola* (SCHOLTZ). Specimen from Europe.

Saldula chipetae, sp. new

Small oblong, black with only two or three, small, pale, subapical spots in outer corium, slightly shining; pubescence very short, brown or golden. Head short, strongly declivent in front, with very short, brownish pubescence, with usual long, upright, dark hairs, with small flavous spot between each ocellus and eye; front with shallow, median, longitudinal furrow between apices of the eyes, the sharply raised, narrow, yellowish, apical ridges not meeting within; clypeus small, narrowed apically, nearly twice as long as wide, yellowish, becoming brownish basally; labrum small, brownish. Rostrum long, ferrugineous, extending between hind coxae. Antennae slender, blackish, shortly pilose, without long, bristly hairs; proportions— I, 12; II, 18; III, 14; IV, 16. Legs largely dark fuscous, clothed with short, whitish hairs; the femora above, apical portions of tibiae and tarsi (save dark tips) testaceous.

Pronotum rather flat, not strongly narrowed anteriorly, a little more than two an a half times as long as wide (width, at base 50, at apex 30; median length 18), deeply, broadly excavated behind; callus not strongly raised, convex, not extending on outer explanate margins, deeply pitted at middle; hind lobe slightly convex, nearly as long as callus. Scutellum nearly flat, black, slightly shining, with shallow impression before the middle; pubescence of pronotum and scutellum short, semi-reclining, dark brown. Hemelytra blackish without conspicuous markings, with short, dark brownish or somewhat golden pubescence; clavus with very small, subapical, whitish spot, slightly darker than rest of hemelytra; corium blackish, rather dull, with one or two, small, subapical, whitish spots in outer corium; membrane yellowish dark fuscous within, each of the four cells with a long dark fuscous streak. Body beneath blackish with grayish hairs.

Length, 3.50 mm.; width 1.54 mm.

Type, male, Gateway, Colo., Sept. 8, 1949, C. J. Drake and F. C. Hottes, in collection of C. J. Drake.

This is one of the smallest of the American species of the genus *Saldula* (Van Duzee); it may be distinguished by its almost solid black color, broad pronotum, short pubescence and nearly flat dorsal surface of the body. The third segment of the antennae is short and the second only slightly longer than the fourth.

Saldula abdominalis (Champion).

Salda abdominalis Champion, Biol. Centr. Amer., Rhynch., 2 : 339, pl. 20, fig. 10. 1900.

A right paramere of a male from La Caji, San Jose, Costa Rica, is figured. The venter in the male is entirely black. In both sexes the exocorium shows a little variation in the amount of pale color. The types were taken in Guatemala.

Saldula brasiliensis Drake and Carvalho.

Saldula brasiliensis Drake and Carvalho, Rev. Ent., Bras., 19: 447. 1948.

In addition to the types, specimens have been examined from Nova Teutonia, Bras., Jan. and Feb., 1950, taken by Fritz Plaumann. The male has the venter entirely black, whereas all but the first and last segments are testaceous in the female. The male is a little smaller than the female. Both sexes have a long, erect, dark, bristly hair on each side of the discal impression of the pronotal callus. A right paramere of a male from Teutonia is illustrated. *S. ventralis* Stal has the last antennal segment broadly annulated with white or testaceous, whereas it is entirely dark in *brasiliensis*.

Figure 3.

Right paramere *Saldula brasiliensis* DRAKE and CARVALHO. Specimen from Brasil.

Figure 4.

Right paramere *Saldula abdominalis* (CHAMPION). Specimen from Costa Rica.

Saldula luctuosa STAL.

Salda luctuosa STAL, Eugenie's Resa, Ins., p. 263. 1859.
Saldula luctuosa DRAKE, Ark. Zool., 42B(3): 1. 1949.

The female (allotype), Albany, Alamanda Co., Calif., is slightly larger than the male, but of a similar, shining, bluish black color. The dorsal vesture of dense, erect or semi-erect, dark hairs are shorter and much finer than in *comatula* (PARSHLEY), but longer than in *S. notalis* DRAKE. These hairs are coarser and much more

conspicuous in *comatula;* also, the second, third and fourth antennal segments of the latter have scattered, long dark bristly hairs. In some specimens of *luctuosa*, the corium is marked with a few brownish or pale spots, and is not entirely of a solid, uniform, shining, blueish black as the type. The Albany specimens were taken in low tidal flats. *S. notalis and S. pallipes* were also found in the same salt-water flats.

Saldula notalis Drake.

Salda notalis Drake, Bull. Brookl. Ent. Soc., 45:4. 1949.

The pronotum and scutellum are black and moderately shining. The hemelytra are dull, brownish black with yellowish brown markings. The lack of a blueish tinge, dull hemelytra and much shorter clothing of fine hairs separate it from *luctuosa.* Specimens are at hand from Albany and San Francisco, Calif. A right paramere of a specimen from Albany is figured.

Saldula opiparia, sp. new

Moderately large, obovate, black with very broad marginal stripes on each side of pronotum and most of hemelytra testaceous or whitish testaceous; pubescence short, reclining, brownish. Head black, with usual six, long, erect, dark, bristly hairs, a round, flavous spot between each ocellus and eye; oceli brownish, approximate, separated by about the distance equal to the diametter of one of them; pubescence short, dense, decumbent, brownish; front with apical callosities very strongly swollen, strongly convex above, almost contiguous within, white-testaceous; clypeus strongly swollen, convex above, one and a half times as long as wide, whitish, the small callosity in bordering area on each side whitish; labrum small, narrowed apically, whitish; bucculae and gula black, clothed with grayish hairs. Rostrum long, ferrugineous, shining, extending between hind coxae. Antennae moderately long, brownish black, shortly pilose; segment I pale testaceous, with large elyptical, black spot on under side; II becoming testaceous apically; III and IV black-fuscous, with a few, scattered, short, dark, bristly hairs.

Pronotum moderately narrowed anteriorly, black, slightly shining, deeply excavated behind, three times as wide at base as median length (proportions—base 60, apex 35, median length 20); lateral margins rather broadly explanate, only slightly rounded (nearly straight); pubescence dense, decumbent, brown or grayish brown; callus moderately swollen, not extending on expanded margins, with large, deep, discal impression; sulcus behind callus deep, arcuate, pitted at bottom; hind lobe slightly convex, a little shorter than callus. Body beneath black, the venter clothed with grayish hairs. Hemelytra usually whitish testaceous with three or four small, blackish spots in outer corium (sometimes without spots; occasionally with inner corium somewhat dusky); clavus velvety, dark fuscous with large whitish apical spot; membrane pale, with four cells, each cell with an elongate dark spot or streak, the veins brownish. Legs testaceous, clothed with short, whitish hairs; femora black beneath, with scattered brownish spots on sides; tibiae with usual dark brown spines; tips of tarsi darkened.

Length, 4.00 to 5.00 mm.; width, 1.65 to 2.25 mm.

Type (male) and allotype (female), Great Salt Lake, Aug. 24, 1949, C. J. Drake and F. C. Hottes in collection of C. J. Drake. Paratypes, 75 specimens taken with type; Bear River Bird Sanctuary, Utah, Aug. 25, 1949, Drake & Hottes; Caldwell, Ida., July 8, 1926 C. J. Drake; Reno; Aug. 6, 1937 and Deeth, Nev., Aug. 6. 1938, Drake & Andre. Other specimens are at hand from California, Ore., Wash., Colo., Wyo., and Br. Col., Canada.

This species was found by the authors in greatest numbers on the beaches of Great Salt Lake but it was also fairly abundant on the shores of alkaline ponds and lakes. It was taken in company with *Pentacora signoreti* (Guerin) and *Saldula pallipes* (Fabr.). On the shores of alkaline waters, it was associated with *S. pallipes, S. saltatoria* (Linn.), *S. comatula* (Parshley) and occasionally *P. signoreti.* In all these habitats as well as fresh water lakes and rivers, *pallipes* was by far the commonest saldid. *S. opiparia* is at times taken sparingly on the shores of fresh waters.

S. opiparia, n. sp. is the species wrongly determined by DRAKE, *Bull. Brookl. Ent. Soc.*, 15: 2 & 3, 1949, as *S. xanthochila limbosa* HORVATH. It is also wrongly named in collections as var. *limbosa.* The records of *S. xanthochila limbosa* by other authors refer largely to *S. opiparia* or *S. coxalis* (STAL). In the Central and Eastern states, records of *xanthochila limbosa* should be referred largely to *S. coxalis* and another species which may prove to be the true *S. xanthochila* (FIEBR) and var. *limbosa* (HORVATH) of Europe. As the authors are in doubt regarding the specific name of the latter species from New Jersey and Michigan, it will be

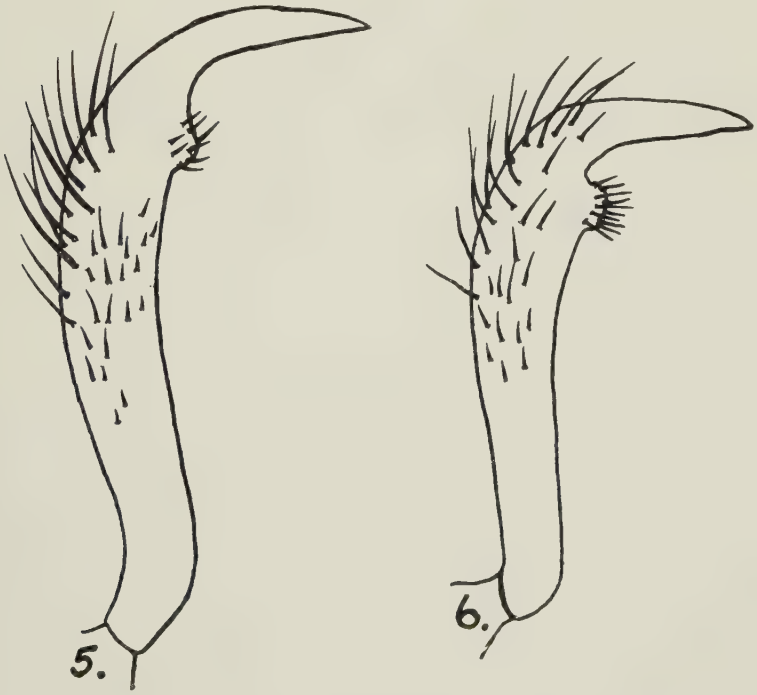

Figure 5.

Right paramere *Saldula notalis* DRAKE. Specimen from California.

Figure 6.

Right paramere *Saldula opiparia* DRAKE and HOTTES. Specimen from Idaho.

treated in a subsequent paper. It also has narrow and broad pronotal stripes on the outer margins and similar pubescence to *xanthochila*.

S. opiparia may be readily separated from *xanthochila limbosa*, by the more flattened pronotum and the longer, denser, and less decumbent pubescence. The pronotum is less narrowed anteriorly and thus is broader in front. These same characters and the very broad, luteous or whitish, stripe on each side of the dorsal surface of the pronotum separate it at once from *S. pallipes*. The right paramere of *S. opiparia* is figured.

Saldula arenicola (Scholtz)

Salda arenicola (Scholtz), Arb. u. verand. Schles. Ges., p. 6. 1846.
Acanthia arenicola Reuter, Rev. d'Ent., p. 251. 1890.
Salda dispersa Uhler, Proc. Ent. Soc. Wash., 2:383. 1893. (New synonymy.).
Saldula dispersa Van Duzee, Cat. Hemip. N. Mex., p. 442. 1917.

A comparison of the type and several paratypes (U. S. Nat. Mus.) of *Saldula dispersa* (Uhler) from Great Salt Lake, Utah, Nev., Ore., and Calif., determined by Van Duzee, Uhler and Heidemann, with a series of *Saldula arenicola* (Scholtz) from Europe shows that these two names apply to the same species. As *S. arenicola* has priority by almost a half century, it becomes the valid name for the species. Insofar as published records are concerned (also, specimens examined by the writers), *arenicola* is found west of the Rocky Mountains in Colo., Utah, Nev., Calif. and Ore., in the Americas. During August, 1949, the writers spent two days collecting for several miles along the shores of Great Salt Lake and were able to collect only two examples of *arenicola* at Saltair. *Saldula pallipes* (Fabr.), *Saldula opiparia*, n. sp. and *Pentacora signoreti* (Guerin) were found on the beaches in numbers at every point visited. *Pallipes* was the commonest and always present in largest numbers.

LISTE DER VON P. CORNELIUS VOGL IN VENEZUELA GEFANGENEN BLATTARIEN

VON

K. PRINCIS (1)

RESUMEN

LISTA DE LOS BLATTIDAE COLECCIONADOS EN VENEZUELA POR EL PADRE CORNELIUS VOGL.—El autor da una lista de los Blattidae coleccionados en Venezuela por el Padre CORNELIUS VOGL e incluye también algunas especies venezolanas de la colección C. WILLEMSE de Eygelshoven, Holanda. El material del Padre C. VOGL se encuentra en el Museo Zoológico Estadal de Bavaria, Alemania. Menciona veinte especies en total, de las cuales dos son nuevas para la ciencia: *Dasyblatta vogli* de Maracay, estado Aragua, y *D. melanocephala* de Caño Colorado, estado Monagas (col. WILLEMSE). Las siguientes especies son nuevas para Venezuela: *Nyctibora obscura* SAUSS., *Epilampra grisea* (DE GEER), *Chromatonotus notatus* (BR. W.), C. *infuscatus* (BRUNER), *Ischnoptera morio* BURM., *Cariblatta aediculata* HEB., *Anaplecta bivittata* BR. W. (Col. WILLEMSE) y *A. suffusa* HEB.. (2).

Vor einiger Zeit erhielt ich von Herrn Dr. WALTER FORSTER (Entomologische Abteilung der Zoologischen Sammlung des Bayerischen Staates, München) Pater CORNELIUS VOGL's Ausbeute venezolanischer Blattarien zweks Bearbeitung. Ich danke verbindlichst den beiden Herren für das interessante Material, das, wenn auch nicht sehr reichhaltig, doch einen nicht unwesentlichen Beitrag zur Kenntnis der Blattarienfauna Venezuelas darstellt. Pater Vogls Ausbeute enthält insgesamt 15 Arten, von welchen 8 neu für Venezuela sind, darunter auch 1 neu für die Wissenschaft. Das ganze Material, einschliesslich der Type der neuen Art, *Dasyblatta vogli*, wird in der Zoologischen Sammlung des Bayeri-

(1) Lund, Suecia.

(2) Las siguientes especies citadas por PRINCIS (1951) para Venezuela no aparecen en el Catálogo de los Blattidae de Venezuela de JOHN W. RHEN (Bol. Ent. Venez. *8* (1 y 2): 11-19, 1949): *Amazonina platystylata* (HEB.), *Chorisoneura parishi* REHN y *Riatia orientis* (HEB.). (Nota del Editor.).

schen Staates in München aufbewahrt; nur einige wenige Dubletten wurden dem Entomologischen Museum der Universität Lund übergeben. Ich ergreife diese Gelenheit, um noch eine weitere neue venezolanische *Dasyblatta*, aus der Sammlung des Herrn Dr. C. Willemse (Eygelshoven in Niederlande) zu beschreiben.

BLATTIDAE

Blattinae

Periplaneta Burm. (1838:502)

P. americana (L.) (1758:424).

1 Larve, Maracay (Aragua), Pater Vogl leg. Bisher ist *P. americana* von La Providencia, Gonzalito und Turmero gemeldet worden (Martorell, 1939:181).

NYCTIBORIDAE

Nyctibora Burm. (1838:501)

N. obscura Sauss. (1864:316).

1 ♂, Maracay, XI-XII. 1934, Pater Vogl leg. *Neu für Venezuela.*

BLABERIDAE

Epilamprinae

Epilampra Burm. (1838:504)

E. grisea (De Geer) (1773:540, t. XLIV, f. 9).

1 ♂, Maracay, Pater Vogl leg. *Neu für Venezuela.*

Epilampra sp.

1 Larve, Maracay, Pater Vogl leg.

Panchlora Burm. (1838:506)

P. nivea (L.) (1758:424).

3 ♂♂ und 2 ♀♀, Maracay, Pater Vogl leg.; 2 ♂♂ und 1 ♀, Maracay, XI-XII.1934, Pater Vogl leg.; 2 ♀♀, Maracay, VIII. 1934, Pater Vogl leg. Ausserdem habe ich noch folgende Exemplare

untersucht: 1 ♂, San Diego de Cabrutica, Anzoátegui, 17.V.1936 (am Lampenlicht), Ing. Th. Vreugde leg. (Coll. Willemse); 1 ♀, Valle la Pascua, Guárico, 28.VI.1936, Ing. Th. Vreugde leg. (Coll. Willemse); 1 ♀, Tucupita, Delta Amacuro, 17.IX.1937, Ing. Th. Vreugde leg. (Coll. Willemse). Bisher lagen für *P. nivea* folgende Meldungen vor: Venezuela (Brunner v. Wattenwyl, 1865:274); La Providencia und Turmero (Martorell, 1939:181); Maracay (Martorell & Salas, 1939 : 234, als *cubensis* gemeldet).

Pycnoscelus Scud. (1862:421)

P. surinamensis (L.) (1758:424).

1 Larve, Maracay, Pater Vogl leg. Bisher ist *P. surinamensis* nur von La Providencia gemeldet worden (Martorell, 1939:181).

Blaberinae

Blaberus Serv. (1831:37)

B. giganteus (L.) (1758:424).

2 ♂♂ und 1 Ex. (ohne Abdomen), Maracay, Pater Vogl leg. Hebard (1916:294) hat diese Art von San Esteban gemeldet.

B. discoidalis Serv. (1839:76, t. I, f. 6).

1 ♂, Maracay, Pater Vogl leg. Bisher lagen für *B. discoidalis* folgende Meldungen vor: Caicara, Rio Orinoco (Hebard, 1916: 296); La Providencia (Martorell, 1939:180).

PSEUDOMOPIDAE

Pseudomopinae

Chromatonotus Heb. (1920:27, 45)

C. notatus (Br. W.) (1893:602, t. LII, f. 1a-b).

1 ♂, Maracay, XI-XII.1934, Pater Vogl leg. Ausserdem habe ich noch folgendes Exemplar gesehen: 1 ♂, San Diego de Cabrutica, Anzoátegui, 17.V.1936 (am Licht), Ing. Th. Vreugde leg. (Coll. Willemse). *Neu für Venezuela.*

C. infuscatus (Bruner) (1906:139).

1 ♀, Maracay, XI-XII.1934, Pater Vogl leg. *Neu für Venezuela.*

Dasyblatta Heb. (1921:224)

Nach dem Geäder der Vorder— und Hinterflügel zu urteilen, ist *Dasyblatta* ein Mitglied des Tribus *Euphyllodromiini*, wobei jedoch die ursprünglich von J. W. H. Rehn (1951:96) gegebenen Grenzen des Tribus etwas erweitert werden müssen. So hat *Dasyblatta* im Gegensatz zu *Chromatonotus* und *Euphyllodromia* einen gut differenzierten Ramus posterior des Radius sowohl im Vorder— als auch im Hinterflügel, und ausserdem ist auch das Apikaldreieck der Hinterflügel bei *Dasyblatta* viel grösser als bei *Chromatonotus*.

Dasyblatta vogli sp. n.

Typus ♂, Maracay, XI-XII.1934, Pater Vogl leg. (Zool. Staats Sammlung München). Kopf hellbraun, zerstreut behaart; interokular-interozellare Area und Mundteile dunkler; Ozellarflecke gelb. Augen schwarzbraun, stark ventralwärts verlängert. Maxillarpalpen von der Kopffarbe, das fünfte Glied etwas länger als das vierte und etwa gleichlang wie das dritte. Antennen dunkelbraun, abstehend bewimpert, mit Ausnahme der zwei ersten Glieder, die dazu auch noch heller als die restlichen Glieder sind. Pronotum zerstreut behaart und mit zwei deutlichen, nach hinten konvergierenden Sulcis versehen; die Scheibe zwischen dem Vorderrande und den beiden Sulcis merklich dunkler, sonst aber sind die übrigen Pronotumteile hellbraun.

Elytren hellbraun, mit mikroskopischen Härchen auf den Adern, die Abdomenspitze beträchtlich überragend; der in Ruhestellung bedeckte Teil des rechten Elytrons allein unbehaart; Ramus posterior des Radius in der Länge etwa gleich einem Drittel der ganzen Elytrenlänge oder etwas kürzer; Media und Cubitus getrennt, mit Zwischenadern und longitudinalen Sektoren, nur die hintersten Sektoren des Cubitus am Suturalrande etwas schräg. Hinterflügel ebenso lang wie die Elytren, hyalin, nur am Vorderrande schwach gebräunt; Radius mit gut differenziertem Ramus posterior, der distal gegabelt ist; Media einfach und durch Queradern sowohl mit dem Radius als auch mit dem 2-ästigen Cubitus verbunden; Apikaldreieck gut entwickelt, in der Ruhestellung eingerollt.

Hinterrand des Metanotums mit einem spitzen mesalen Vorsprung, der auf dem 1. Tergite beiderseits von je einem gerundeten, wulstigen Kiel flankiert wird; die Kiele divergieren stark nach hinten und reichen mit ihren Hinterenden fast bis zum Hinterrande des 1. Tergites. Dorsum des Abdomens unspezialisiert, schmutzigbraun. Supraanalplatte ähnlich der von *D. chopardi*, jedoch mit dem transversalen Sulcus nicht geradlinig, sondern mehr oder weniger konvex; auch die diestale Spitze des hinteren, schwächer chitinisierten Teiles der Platte ist deutlich abgerundet anstatt ausgerandet. Cerci von der Körperfarbe, ziemlich robust. Subgenitalplatte (Fig. 1) asymmetrisch, durch eine seichte Einbuchtung am linken Stylus in zwei Teile geteilt, wobei der linke Teil gut 2mal kürzer ist als der rechte (bei *chopardi* nur unwesentlich kürzer); demzufolge ist der rechte Stylus viel weiter nach hinten verschoben als der linke (bei *chopardi* unterscheiden sich die beiden Styli in dieser Hinsicht nur unbedeutend). Es ist noch zu beachten, dass der Hinterrand der Subgenitalplatte dorsalwärts eingerollt ist, weshalb in der Figur 1 nur die Spitze des rechten Stylus zum Vorschein kommt. Abdomenunterseite schmutzigbraun, Beine hellbraun. Vorderer Unterrand der Vorderschenkel nach Typus B bedornt und mit 3 Distaldornen versehen; hinterer Unterrand mit 3 Dornen (1 distal, 1 subdistal und 1 mesal). Unterränder der Mittel— und Hinterschenkel kräftig bedornt. Alle 4 proximale Tarsalglieder mit kleinen apikalen Pulvillen; Tarsalklauen gleichgross, unspezialisiert; Arolien klein.

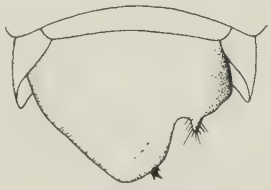

Figure 1.

Dasyblatta vogli sp. n., (Type). Subgenitalplatte. Vergr.

Paratypus ♀, Maracay, XI-XII.1934, Pater Vogl leg. (Zool. Staats Sammlung München). Ähnlich dem Männchen. Supraanalplatte dreieckig vorgezogen, mit schwach konkaven Seitenrändern und breit gerundeter Spitze, die deutlich über die Subgenitalplatte hinausragt. Subgenitalplatte mit gleichmässig gerundetem Hinterrande, kürzer als die Supraanalplatte. Es liegen ausserdem noch vor: 3 ♀♀, Maracay, V.1935 bzw. VI.1936 bzw. VIII.1934, Pater Vogl leg. (Zool. Staats sammlung München); 1 ♀, Maracay, Pater Vogl leg. (Mus. Lund).

Körpermasse (in mm)

	Körper-laenge	Pronotum-laenge	Pronotum-breite	Elytren-laenge
♂ (Typus), XI-XII.1934	9	2	2.8	9
♀ (Paratypus), XI-XII.1934	9.5	2.2	3	9.5
♀, V.1935	9.8	2.4	3	10
♀, VI.1936	9.4	2.4	3	10
♀, VIII.1934	9.5	2.4	3	9.5
♀, (Mus. Lund.)	10	2.5	3.2	10

Bisher sind nur 2 *Dasyblatta*-Arten beschrieben worden, und zwar die brasilianische *D. thaumasia* Heb. und die argentinische *D. chopardi* Heb. Die vorliegende neue *Dasyblatta* ist etwas kleiner als die beiden obengenannten Arten und auch sonst von diesen leicht zu unterscheiden, wie wir das schon oben in bezug auf *D. chopardi* gesehen haben. Was aber *D. thaumasia* anbelangt, so fehlt bei ihr die transversale Furche auf der männlichen Subgenitalplatte, die auch sonst verschieden gestaltet ist.

Dasyblatta melanocephala sp. n.

♀ (Typus), Caño Colorado, Monagas, 15.VIII.1937, Ing. Th. Vreugde leg. (Coll. Willemse). Kopf glänzend schwarz, mit

zerstreuten Härchen, die in kleinen Grübchen sitzen; interokularer Abstand nur etwa halb so gross wie der Abstand zwischen den Antennenbasen; Ozellarflecke gelb, Mundteile und Maxillarpalpen hellbraun. Augen stark ventralwärts verlänger und fast bis zu den Maxillarpalpen reichend. Fünftes Glied der Maxillarpalpen etwas länger als das vierte und ungefähr gleichlang wie das dritte. Vorderrand und Seitenränder des Pronotums schmutzigweiss, die übrigen Pronotumteile tief kastanienbraun mit einer kaum wahrnehmbaren helleren Mittellinie. Oberfläche des Pronotums von zerstreuten, aufrechten Härchen besetzt und mit zwei seichten, nach hinten konvergierenden Sulcis versehen.

Elytren braun, die Abdomenspitze beträchtlich überragend, behaart (die mikroskopischen Härchen sitzen hauptsächlinch auf den Längsadern); der in Ruhestellung bedeckte Teil des rechten Elytrons allein unbehaart. Sektoren des Cubitus longitudinal, nur diejenigen am Suturalrande etwas schräg. Hinterflügel ebenso lang wie die Elytren, hyalin, nur am Vorderrande schwach gebräunt; Media einfach, durch Queradern mit dem Radius verbunden; auch zwischen Media und Cubitus sind Queradern vorhanden; Cubitus 3ästig; Apikaldreieck gut entwickelt.

Hinterrand des Metanotums mit einem stumpfen mesalen Vorsprung und beiderseits von diesem mit je einem langen, dünnen Anhang, der etwa bis zur Mitte des 1. Tergites reicht. Oberseite des Abdomens dunkelbraun, an der Basis heller. Supraanalplatte annähernd dreieckig, mit konkaven Seitenrändern und breit gerundetem Distalteil, der heller als der Rest der Platte aussieht und kaum chitinisiert ist. Cerci schwarzbraun, stark behaart und beborstet. Abdomenunterseite ebenfalls schwarzbraun. Subgenitalplatte gross, mit gleichmässig gerundetem und stark bewimpertem Hinterrande. Beine hellbraun; Coxen proximal kastanienbraun, distal hellbraun. Vorderer Unterrand der Vorderschenkel nach Typus B bedornt und mit 3 Distaldornen versehen; hinterer Unterrand mit 3 Dornen (1 distal, 1 subdistal und 1 mesal). Unterränder der Mittel— und Hinterschenkel kräftig bedornt. Alle 4 proximalen Tarsalglieder mit kleinen apikalen Pulvillen; Tarsalklauen gleichgross, unspezialisiert; Arolien klein. Körperlänge 11 mm,

Pronotumlänge 3 mm, Pronotumbreite 3.8 mm, Elytrenlänge 13 mm.

Die neue Art zeichnet sich durch ihren einfarbig schwarzen Kopf aus. Die übrigen Arten der Gattung *Dasyblatta*, einschliesslich der hier beschriebenen *D. vogli*, haben den Kopf bis zu den Ozellen dunkelbraun und weiter ventralwärts hellbraun.

Ischnoptera Burm. (1938:500)

I. morio Burm. (1838: 500).

1 ♂, Maracay, Pater Vogl leg. *Neu für Venezuela.*

Cariblatta Heb. (1916a:147)

C. aediculata Heb. (1916a:179, t. XI, f. 18-19, t. XII, f. 19-20).

1 ♀, Maracay, XI-XII.1934, Pater Vogl leg. *Neu für Venezuela.*

Amazonina Heb. (1929:353)

A. platystylata (Heb.) (1921:229, t. IX, f. 21-23, t. X, f. 1).

2 ♀♀, Maracay, XI-XII.1934, Pater Vogl leg. Bisher ist *A. platystylata* von Caracas und Maracaibo gemeldet worden (Princis, 1951:40).

Lophoblatta Heb. (1929:350)

L. arawaka Heb. (1929:350, t. XIII, f. 6-7).

3 ♀♀, Caño Colorado, Monagas, 18 bzw. 21.VIII.1937, Ing. Th. Vreugde leg. (Coll. Willemse). Die einzige bisher vorliegende Meldung ist von Cariaquito (Hebard, 1929:353).

Chorisoneurinae

Chorisoneura Br. W. (1865:255)

C. parishi Rehn (1918:163, t. I, f. 19-21).

1 ♂, Maracay, XI-XII.1934, Pater Vogl leg. Bisher ist *C. parishi* von Caracas, Macuto und Puerto Cabello gemeldet worden (Princis, 1951:16).

ANAPLECTINAE

Riatia WALK. (1868:66)

R. orientis (HEB.) (1926:135, t. XII, f. 1).

2 ♂♂, Maracay, V bzw. XI-XII.1934, Pater VOGL leg. Die einzige bisher vorliegende Meldung ist von Caracas (PRINCIS, 1951: 69).

Anaplecta BURM. (1838:494)

A. bivittata BR. W. (1865:63).

1 ♀, Caño Colorado, Monagas, 21.VIII.1937, Ing. TH. VREUGDE leg. (Coll. WILLEMSE). *Neu für Venezuela.*

A. suffusa HEB. (1926:141, t. XII, f. 6-7).

1 ♀, Maracay, XI-XII.1934, Pater VOGL leg. *Neu für Venezuela.*

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OBSERVACIONES SOBRE LA BIOLOGIA DE ALGUNOS COCCINELLIDAE (COLEOPTERA) (1)

por

Waclaw Szumkowski (2)

Abstract

OBSERVATIONS ON THE BIOLOGY OF SOME COCCINELLIDAE (COLEOPTERA).— The author discusses the predatory effect of several Coccinellidae on the eggs and larvae of Lepidopterous insect pests and correlates the abundance of Coccinellids in the field with the number of *Alabama argillacea* (Hbn.) *and Laphygma frugiperda* S. & A.. The life cycle of *Coleomegilla maculata* Deg. and recommendations for the protection of Coccinellidae are given.

Los coccinélidos son conocidos y se han descrito numerosas veces en la literatura como predatores de insectos de tamaño reducido y cuerpo blando del orden Homoptera, pero es injusto limitar el poder destructivo de estos insectos beneficiosos sobre un grupo de insectos dañinos.

Ya Comstock en el año 1879 observó la destrucción de dos huevos de *Alabama argillacea* (Hbn.) sin alimentarse de ellos, por una larva de *Hippodamia convergens* Guer., y supone la posibilidad de que los coccinélidos, abundantes en el algodonero, destruyan tales huevos.

Después de Comstock, varios autores observaron la acción predatora realizada por varios coccinélidos sobre algunos Lepidópteros, Hemípteros y Coleópteros, y a continuación se citan algunas observaciones importantes concernientes a *Coleomegilla maculata* Deg. y *Cycloneda sanguinea* L. El primero de estos insectos es citado en la literatura como *Megilla maculata*, *Coleomegilla fuscilabris* y *Ceratomegilla fuscilabris*, todos sinónimos de *Coleomegilla maculata*, en opinión del Dr. E. A. Chapin comunicada en carta al suscrito.

(1) Este trabajo ha sido mencionado en otras publicaciones con el mismo título, en prensa, Bol. Ent. Venez. 1950.

(2) División de Entomología, Instituto Nacional de Agricultura, Maracay.

AUTOR	AÑO	PAIS	PREDATOR	INSECTO PRESA	PERIODO
Bodkin	1913-1919	Guayana Británica	*Megilla maculata*	*Laphygma frugiperda*	Larval
Lunginbill	1928	U. S. A.	*Ceratomegilla fuscilabris*	" "	Huevo
Winburn & Paitner	1932	" " "	" "	*Heliothis obsoleta*	Larval
Philips & King	1923	" " "	" "	" "	Huevo-Larval
Marcovitch & Stanley ..	1940	" " "	" "	" "	No indicado
Ewing & Ivy	1943	" " "	*Coleomegilla fuscilabris*	" "	Huevo
Willy	1951	Perú	*Cycloneda sanguinea*	" "	No indicado
Fitofilo II.4	1943	Méjico	*Ceratomegilla fuscilabris*	" "	Huevo
Crawford	1922	U. S. A.	*Megilla maculata*	*Pyrausta nubilalis*	"
Bodkin	1914	Guayana Británica	*Megilla maculata*	*Remigia repanda*	Larval
Eddy	1940	U. S. A.	*Megilla fuscilabris*	*Colias eurytheme*	"
Hovard	1921	" " "	*Megilla maculata*	*Epilachna corrupta*	Huevo-Larval
Eddy	1926	" " "	" "	" "	Huevo
Eddy & Mc Alister	1927	" " "	*Coleomegilla maculata*	" "	No indicado
Hovard	1921	" " "	*Cycloneda sanguinea*	" "	Huevo-Larval
Chittenden	1927	" " "	*Megilla maculata*	*Crioceris asparagi*	No indicado
Bbitton	1922	" " "	*Ceratomegilla fuscilabris*	" "	" "
Cotton	1917	Puerto Rico	*Cycloneda sanguinea*	*Corythaica monacha*	Ninfa
Wallace	1920	U. S. A.	*Megilla maculata*	*Blissus leucopterus*	Huevo-Ninfa

Durante los años 1948-1950, el autor estudió los coccinélidos más comunes en los Estados Aragua y Carabobo, y su relación con los Lepidópteros, Coleópteros, Hemípteros y Homópteros, realizando simultáneamente observaciones en el campo y estudios en el laboratorio. Estos coccinélidos fueron: *Coleomegilla maculata* DEG., *Cycloneda sanguinea* L., *Scymnus limbaticollis* MULS., *Scymnus tardus* MULS., *Hiperaspis connectens* THUNB., *Hiperaspis festiva* MULS. y siendo los insectos presas los siguientes: *Alabama argillacea* (HBN.), *Laphygma frugiperda* S. & A., *Feltia subterranea* F., *Prodenia latifascia* WALK., *Agrotis repleta* WALK., *Diatraea lineolata* WALK. (huevos y larvas), *Sacadodes pyralis* DYAR (huevos), *Dysdercus* sp. (huevos y ninfas), *Saccharosydne saccharivora* WESTW. (ninfas y adultos) y *Aphis gossypii* GLOV.

MATERIAL Y METODO USADO

Para los ensayos en el laboratorio se usaron laticas de 7,5 cm. de diámetro por 3 cm. de altura, excepto cuando se deseaba observar directamente la acción predatora, que se usaron placas petri de 10 cm. de diámetro. Los predatores en observación se colocaron en las laticas o placas petri junto con la comida y los contajes se efectuaron cada 24 horas.

Los huevos de lepidópteros fueron obtenidos en el laboratorio en frascos de oviposición sobre papel toalla y hojas frescas, no observándose diferencia sobre la acción predatora en uno u otro caso. Ocasionalmente se usaron huevos frescos obtenidos directamente del campo. Las larvas de lepidópteros necesarias para los ensayos fueron obtenidas de las crías en el laboratorio y el material de *Aphis gossypii* fué traído del campo sobre hojas de algodón.

I.—ACCION PREDATORA SOBRE LEPIDOPTEROS

A.—DESTRUCCION DE HUEVOS DE LEPIDOPTEROS

a) Huevos de *Alabama argillacea*

Las larvas y adultos de *Coleomegilla maculata* destruyen vorazmente los huevos de *Alabama argillacea* en presencia o ausencia

de áfidos, habiéndose observado larvas que comieron hasta 120 huevos en ausencia de áfidos y 104 huevos en presencia de éstos, durante veinticuatro horas.

En los ensayos con seis larvas de *Coleomegilla maculata*, a las cuales se les proporcionaron huevos de *Alabama argillacea* en presencia de numerosos áfidos, se obtuvo un promedio de 407 huevos destruídos por larva en su período larval, con un máximo individual de 468 huevos, observándose siempre una evidente predilección por los huevos.

En otro ensayo con cinco larvas de *Coleomegilla maculata* en ausencia de áfidos, se obtuvo un promedio de 500 huevos de *Alabama argillacea* destruídos por una larva durante los seis últimos días de su vida larval, y un promedio de 83 huevos destruídos por una larva durante veinticuatro horas.

Los adultos de *Coleomegilla maculata* llegaron a destruír en veinticuatro horas 130 y 128 huevos, con un promedio diario de 98 y 83 respectivamente, en ausencia y presencia de áfidos. Durante todos los ensayos, los adultos demostraron la misma predilección por los huevos de *Alabama argillacea*, como anteriormente se observó en el estudio con las larvas.

Otro coccinélido, *Cycloneda sanguinea* en el período larval y como adulto ataca y destruye también los huevos de *Alabama argillacea*, pero en número reducido, y su preferencia por los áfidos fué claramente observada. Así que en el curso de 66 observaciones, las larvas y adultos de *Cycloneda sanguinea* rehusaron 46 veces a los huevos de *Alabama argillacea* y 20 veces los comieron, y como máximo hemos anotado la destrucción de 26 y 24 huevos respectivamente, en ausencia y presencia de áfidos, por una larva de *Cycloneda sanguinea*, mientras que un adulto destruyó 16 huevos en ausencia de áfidos y 3 con ellos presentes, durante veinticuatro horas.

b) **Huevos de** *Feltia subterranea*

En los ensayos realizados con huevos de *Feltia subterranea*, las larvas y adultos de*Coleomegilla maculata* siempre han destruído estos huevos, tanto en presencia como en ausencia de áfidos,

llegando una larva a comer 92 huevos durante veinticuatro horas, sin áfidos presentes.

Los adultos y larvas de *Cycloneda sanguinea*, seis veces en presencia y dos veces en ausencia de áfidos han rehusado los huevos de *Feltia subterranea* y sólo en dos casos han aceptado huevos de este noctuido, llegando una larva a destruir 6 huevos en veinticuatro horas, en ausencia de áfidos.

c) **Huevos de** *Laphygma frugiperda*

Los huevos de este lepidóptero son depositados en masas y protegidos con una secreción sedosa que dificulta los ataques de los predatores. A pesar de esta protección, se ha observado durante los ensayos que dos masas de huevos protegidos fueron destruídos por cuatro larvas de *Coleomegilla maculata*, comenzando la destrucción inmediatamente después de haberse comido 20 áfidos simultáneamente proporcionados.

En otros ensayos con masas de huevos de *Laphygma frugiperda*, insuficientemente o no protegidas, se observó que eran siempre vorazmente destruídas por larvas y adultos de *Coleomegilla maculata* en presencia y ausencia de áfidos.

Se ha observado la acción predatora de larvas recién nacidas de este insecto sobre huevos de *Laphygma frugiperda*, y la destrucción de 80 huevos por una larva mediana de cuatro días de edad y de 118 huevos por un adulto, en presencia de áfidos, durante veinticuatro horas.

El otro predator, *Cycloneda sanguinea*, ha rehusado los huevos de *Laphygma frugiperda* protegidos con pelos, pero en ausencia de áfidos se han observado destrucciones de más limitado número de huevos desprovistos de pelos por larvas de este coccinélido, observándose que tres de estas larvas comieron 230 huevos durante dos días y otra larva se comió 40 huevos en un día.

d) **Huevos de** *Prodenia latifascia*

Los huevos de *Prodenia latifascia* se encuentran en masas a veces muy grandes de varios centenares y dispuestos en una, dos

o tres capas protegidas o no, como en el caso de *Laphygma frugiperda.*

Tanto las larvas como los adultos de *Coleomegilla maculata* destruyen estos huevos en número considerable. En los ensayos realizados, se ha observado la destrucción de 135 huevos por una larva y 425 huevos por un adulto en ausencia de áfidos, durante veinticuatro horas, en ambos casos de huevos no protegidos.

Es evidente que la secreción sedosa presenta dificultades a los ataques del predator, pero a pesar de ella, un adulto de *Coleomegilla maculata* llegó a destruir 240 huevos durante dos días sucesivos.

Las larvas y adultos de *Cycloneda sanguinea* han destruído también los huevos de *Prodenia latifascia* no protegidos, habiéndose observado durante los ensayos con este predator, que una larva destruyó 66 huevos de 66 presentados en ausencia de áfidos, durante veinticuatro horas.

e) **Huevos de** *Agrotis repleta*

Las larvas y adultos de *Coleomegilla maculata* comen huevos de *Agrotis repleta.* En uno de los ensayos, un adulto de *Coleomegilla maculata* comió 95 huevos en veinticuatro horas en presencia de áfidos. En otros ensayos, una larva en los últimos cuatro días de su vida larval, comió en ausencia de áfidos, 153 huevos de este noctuido, de 153 presentados, con el máximo de 52 huevos destruídos durante veinticuatro horas, y otra larva en presencia de áfidos, ha destruído 63 huevos durante doce días, con el máximo de 32 huevos destruídos en veinticuatro horas.

No se hicieron observaciones sobre la destrucción de huevos de *Agrotis repleta* por *Cycloneda sanguinea.*

f) **Huevos de** *Sacadodes pyralis*

En todos los ensayos, *Coleomegilla maculata* y *Cycloneda sanguinea* han rehusado los huevos de *Sacadodes pyralis*, posiblemente por ser estos espinosos, lo cual los protege de los ataques de los predatores.

g) **Huevos de** *Diatraea lineolata*

La forma aplastada de los huevos de *Diatrea* y su disposición en masas de forma imbricada, parece presentar dificultades a la acción de los predatores, pero no los preserva de la destrucción por larvas de *Coleomegilla maculata* en presencia y ausencia de áfidos. Durante los ensayos, una larva destruyó 41 huevos en un día, mientras que los ensayos con adultos dieron resultados negativos. También fueron negativos los ensayos con larvas y adultos de *Cycloneda sanguinea.*

B.—DESTRUCCION DE LARVAS DE LEPIDOPTEROS

Las larvas y adultos de *Coleomegilla maculata* y *Cycloneda sanguinea* no limitan su acción predatora a los huevos de los lepidópteros, sino que también destruyen gran número de larvas de varios instares de estos insectos.

En múltiples ensayos con larvas y adultos de ambos predatores, siempre se observó la destrucción de larvas del 1º y 2º instar de *Alabama argillacea, Laphygma frugiperda, Prodenia latifascia, Agrotis repleta* y *Diatraea lineolata.*

Un perfecto blanco para los ataques de los predatores, presentan las larvitas de *Laphygma frugiperda, Prodenia latifascia* y *Diatraea* sp., por quedar agrupadas al nacer sobre las cáscaras de los huevos durante varias horas.

De las muchas observaciones realizadas se mencionan algunas que presentan el máximo anotado de larvas destruídas durante 24 horas por un predator. Se ha notado la destrucción de:

a) Larvas de *Alabama argillacea* en ausencia de áfidos: 59 larvas del primer instar por una larva de *Coleomegilla maculata* y 43 larvas del primer instar por un adulto del mismo predator.

b) Larvas de *Laphygma frugiperda* en ausencia de áfidos; 98 larvas del primer instar por una larva de *Coleomegilla maculata,* 84 larvas del primer instar por un adulto y 24 larvas del segundo instar por otro adulto de este predator.

c) Larvas de *Prodenia latifascia* en ausencia de áfidos: 140 larvas del primer instar por una larva de *Colcomegilla maculata,* 90 larvas del primer instar por un adulto, 18 larvas del segundo instar por una

larva y 38 larvas del segundo instar por un adulto del mismo predator; 115 larvas del primer instar por un adulto de *Cycloneda sanguinea*.

d) Larvas de *Agrotis repleta*: 150 larvas del primer instar por un adulto de *Coleomegilla maculata* en ausencia de áfidos y 50 larvas del primer instar por otro adulto en presencia de muchos áfidos.

e) Larvas de *Diatraea lineolata:* 20 larvas del primer instar de veinte proporcionadas por una larva de *Coleomegilla maculata* en presencia de reducido número de áfidos; 27 larvas del primer instar por una larva de *Cycloneda sanguinea* en ausencia de áfidos, 23 larvas del primer instar por dos adultos de *Cycloneda sanguinea* y 27 larvas del primer instar por otros dos adultos del mismo predator en presencia de muchos áfidos.

Con el crecimiento de las larvas en instares avanzados, disminuye el número de larvas destruídas y también los coccinélidos rehusan muchas veces estas larvas.

En 48 ensayos con larvas de varios lepidópteros del 3º instar, se observó que los coccinélidos rehusaron 28 veces y solamente 20 veces destruyeron estas larvas con un máximo anotado de 4 de *Agrotis repleta* en 24 horas por una larva de *Coleomegilla maculata* y 4 de *Prodenia latifascia* en 24 horas por una larva de *Cycloneda sanguinea*.

En 33 ensayos con larvas del 4º instar de *Laphygma frugiperda*, *Prodenia latifascia* y *Agrotis repleta*, las larvas y adultos de *Coleomegilla maculata* las rehusaron 25 veces y 8 veces las destruyeron con un máximo de una larva en 24 horas.

En 13 observaciones con larvas del 5º instar, solamente una larva de *Cycloneda sanguinea* mató una larva de *Alabama argillacea* más grande que el predator, quedando ésta parcialmente chupada.

En otros ensayos le fueron proporcionadas a los predatores, larvas de varios instares y de varias especies de lepidópteros durante un largo período. En uno de estos ensayos un adulto de *Coleomegilla maculata*, durante 20 días sucesivos, destruyó 644 larvas de varios instares de *Alabama argillacea*, *Laphygma frugiperda* y *Prodenia latifascia*. El siguiente CUADRO demuestra estos datos:

CUADRO Nº 1.

ESPECIE DE LEPIDOPTEROS	NUMERO DE LARVAS DESTRUIDAS EN INSTARES 1º	2º	3º	4º	5º	TOTAL
Alabama argillacea ..	96	6	1	—	—	103
Laphygma frugiperda	134	34	12	1	—	181
Prodenia latifascia ..	320	29	11	—	—	360
TOTAL:	550	69	24	1	—	644

El CUADRO Nº 2 muestra el número máximo de larvas de diferentes instares destruídas por el mismo adulto de *Coleomegilla maculata* durante veinticuatro horas:

CUADRO Nº 2

ESPECIE DE LEPIDOPTEROS	NUMERO MAXIMO DE LARVAS DESTRUIDAS EN 24 HORAS — INSTARES 1º	2º	3º	4º	5º
Alabama argillacea	43	5	1	—	—
Laphygma frugiperda	84	17	3	—	—
Prodenia latifascia	90	19	—	—	—

En otros ensayos, un adulto de *Coleomegilla maculata* durante veinte días, destruyó 400 larvas de *Agrotis repleta* así: 381 del 1º instar, 15 del 2º, 3 del 3º y 1 del 4º instar.

II.—ACCION PREDATORA SOBRE COLEOPTEROS

Aún cuando no se hicieron ensayos con insectos dañinos del orden Coleoptera, durante los ensayos realizados anteriormente, se observaron muchas veces que larvas y adultos de *Coleomegilla maculata* y *Cycloneda sanguinea* destruyen sus huevos recíprocamente y también los de su misma especie. En estas observaciones se notó la destrucción de 71 huevos de su especie por una larva de *Coleomegilla maculata* en presencia de áfidos durante tres días, con un máximo de 31 huevos de los 31 proporcionados en veinticuatro horas.

En otro ensayo, una larva de *Cycloneda sanguinea* destruyó en presencia de áfidos, 26 huevos de su especie de los 26 proporcionados en un día y 26 huevos de *Coleomegilla maculata* de los 26 proporcionados el día siguiente. También en los frascos y jaulas de cría de *Coleomegilla maculata* se ha observado siempre un alto grado de canibalismo entre las larvas, así como también la destrucción de huevos y larvas por adultos.

III.—ACCION PREDATORA SOBRE HEMIPTEROS

De una cría en el laboratorio de *Dysdercus* sp., ofrecimos a los coccinélidos los huevos de esta especie. En múltiples ensayos, dieciocho adultos de *Cycloneda sanguinea* siempre rehusaron comer estos huevos, pero un adulto de *Coleomegilla maculata* destruyó en un ensayo, 5 huevos proporcionados en ausencia de áfidos. En 60 ensayos con ninfas de *Dysdercus*, 14 adultos de *Cycloneda sanguinea* rehusaron 32 veces comer las ninfas, mientras que 28 veces mataron y chuparon ninfas del 1º y 2º instar. En otro ensayo, dos adultos de *Cycloneda sanguinea* destruyeron 30 ninfas del 1º y cinco del 2º instar durante 17 días sucesivos, llegando a matar 9 ninfas del 1º instar en 24 horas y 3 del 2º instar el siguiente día. Dos adultos de *Coleomegilla maculata*, 8 veces rehusaron las ninfas presentadas y una vez se notó la destrucción de una ninfa del 1º instar.

IV.—ACCION PREDATORA SOBRE HOMOPTEROS

Aún cuando la acción predatora de los coccinélidos sobre los áfidos es bien conocida, se hicieron contajes para determinar el

número de *Aphis gossypii* destruídos por un predator. Las cifras referentes a áfidos se deben tomar como aproximadas por las dificultades en el manejo de estos insectos, aún cuando se trató de proporcionar áfidos de tamaño mediano en los ensayos efectuados.

En un ensayo con 7 larvas de *Coleomegilla maculata* se notó el promedio de 449 áfidos destruídos por una larva durante todo el período de su vida larval; el promedio de 45 áfidos destruídos por una larva durante un día, y el máximo de 120 áfidos destruídos por una larva durante 24 horas.

En otros ensayos con 4 adultos de la misma especie, se observó un promedio de 82 y un máximo de 125 áfidos destruídos por un adulto durante 24 horas.

Similares resultados demostraron 4 adultos de *Cycloneda sanguinea*, dando un promedio de 69 y un máximo de 145 áfidos destruídos por un adulto durante 24 horas.

En otros ensayos se ha demostrado la destrucción de *Saccharosydne saccharivora* por los predatores. En un caso, dos adultos de *Coleomegilla maculata* chuparon y mataron 3 adultos y 4 ninfas de *Saccharosydne* de 3 adultos y 4 ninfas presentados durante un día, y en otro caso 2 adultos de *Cycloneda sanguinea* chuparon y mataron 3 adultos de *Saccharosydne* de los 3 presentados durante un día.

V.—OBSERVACIONES SOBRE OTROS COCCINELIDOS

Cuatro de otras especies mencionadas al comienzo: *Scymnus limbaticollis*, *Scymnus tardus*, *Hiperaspis connectens* e *Hiperaspis festiva* fueron ensayados también como posibles predatores de huevos y larvas de lepidópteros.

En 65 ensayos realizados en presencia de áfidos, las larvas y adultos de estos coccinélidos han rehusado los huevos y sólo en tres oportunidades se notó la acción muy limitada de las larvas de *Scymnus limbaticollis* y de *Hiperaspis* sp. sobre huevos y larvas de *Alabama argillacea* y huevos de *Laphygma frugiperda*, estos últimos desprovistos de los pelos que los cubren.

En uno de estos ensayos, 3 larvas de *Scymnus limbaticollis* destruyeron en dos días sucesivos 6 huevos de *Alabama argillacea* y 1 huevo de *Laphygma frugiperda*. En otro ensayo 1 larva de *Hiperaspis* sp. destruyó 2 huevos de *Alabama argillacea*, y en un tercer ensayo una larva de *Hiperaspis* sp. destruyó en un día 11 larvas recién nacidas de *Alabama argillacea*.

Durante otros ensayos realizados en ausencia de áfidos, las larvas y adultos de *Scymnus* sp. 18 veces rehusaron a las larvas del 1º instar de *Alabama argillacea* y 22 veces comieron una hasta dos de estas larvas en 24 horas. Las mismas larvas de *Scymnus* sp. 13 veces rehusaron a las larvas de *Alabama argillacea* del 2º instar y 5 veces las comieron, llegando a destruir una larva durante 24 horas.

Por otra parte, en todos los ensayos se observó que estos coccinélidos destruyen considerable número de áfidos. Se han notado: la destrucción de 30 áfidos como máximo individual y 18 como promedio en 12 observaciones, por larvas de *Scymnus limbaticollis;* la destrucción de 12 áfidos como máximo individual y 9 como promedio en dos observaciones, por adultos de la misma especie; la destrucción de 15 áfidos como máximo individual y 12 como promedio en cinco observaciones, por larvas de *Scymnus tardus*; la destrucción de 38 áfidos como máximo individual y 19 como promedio en 20 observaciones, por larvas de *Hiperaspis connectens*, y la destrucción de 40 áfidos como máximo individual y 21 como promedio en 11 observaciones, por adultos de *Hiperaspis connectens*.

VI —OBSERVACIONES EN EL CAMPO

Las observaciones en el campo confirman el importante papel que desempeñan *Coleomegilla maculata* y *Cycloneda sanguinea* en el combate natural de los lepidópteros dañinos.

Durante los años 1948, 1949 y 1950 se han examinado las siembras de maíz realizadas en el período seco en los meses de enero hasta abril, aprovechando sitios húmedos a la orilla de la Laguna de Valencia. Sobre estas siembras se han encontrado en este período, abundantes *Coleomegilla maculata* y especialmente

numerosos *Cycloneda sanguinea* a pesar de la completa ausencia de *Aphis maidis* Fitch. Estas tempranas siembras de maíz presentan condiciones favorables para el desarrollo de los primeros brotes de *Laphygma frugiperda* y se podría contar con un alto grado de infestación por esta plaga. A despecho de estas suposiciones, las larvas de *Laphygma frugiperda* se encuentran en número tan reducido que la plaga puede contarse como dominada completamente por los predatores.

En una ocasión los Dres. Pedro Fenjves y Luis A. Salas tuvieron oportunidad de observar directamente, en el año 1949, la destrucción de una masa de huevos de *Laphygma frugiperda* cubiertos con pelos, por un adulto de *Coleomegilla maculata*.

Al mismo tiempo, las observaciones realizadas en algodonero durante dos años sucesivos mostraron una correlación entre los predatores Coccinélidos y *Alabama argillacea* en condiciones de ausencia de áfidos.

En 1948 este noctuido se presentó abundantemente en todos los campos de algodón en los Estados Aragua y Carabobo hasta el mes de diciembre cuando desapareció del campo. En ese mismo año, las larvas y adultos de *Coleomegilla maculata* y *Cycloneda sanguinea* eran también abundantes en los campos de algodón a pesar de la ausencia de áfidos.

En 1949 los ataques de *Alabama argillacea* fueron muy reducidos y aparecieron en forma de pequeñas manchas, raras de encontrarse, de tal modo que el algodonero estaba libre de esta plaga. Durante este mismo año, las larvas y adultos de *Coleomegilla maculata* y *Cycloneda sanguinea* se presentaron en abundancia solamente en los campos de algodón infestados por *Aphis gossypii* y desaparecieron, prácticamente, con la ausencia de éstos.

Las observaciones sobre *Scymnus limbaticollis*, *Scymnus tardus*, *Hiperaspis connectens* e *Hiperaspis festiva* demuestran su estrecha dependencia de la presencia de los áfidos en varios cultivos y confirman su gran valor como predatores de esta plaga.

VII.—BREVES DATOS SOBRE EL CICLO DE DESARROLLO Y OVIPOSICION

El autor cree interesante presentar algunas observaciones sobre la oviposición de *Coleomegilla maculata* y el ciclo de desarrollo en relación con la temperatura. Se ha notado de 8 a 25 días para el período de preoviposición, de 3 a 4 días para el período de incubación, de 9 a 17 días para el período de su vida larval y de 4 hasta 12 días para el período pupal.

En uno de los ensayos, una hembra de *Coleomegilla maculata* después de 14 días de preoviposición durante 75 días de su vida, ha depositado 20 masas de huevos, con 6 hasta 44 en cada masa y en total 373 huevos. Otra hembra depositó 568 huevos durante 109 días de su vida.

VIII.—LA IMPORTANCIA DE LOS COCCINELIDOS COMO PREDATORES Y METODOS DE PROTEGERLOS EN EL CAMPO

Para valorar plenamente el papel que desempeñan los coccinélidos como predatores de insectos dañinos, se debe tener en cuenta que estos insectos beneficiosos empiezan su acción después de un período de estacionamiento sobre las cáscaras de los huevos y siguen tal acción, sin interrumpirla, durante toda su vida larval, y como adultos, después de una corta pausa del período pupal. Esta acción predatora se cumple en el período inicial del desarrollo del insecto dañino (huevos y larvas chicas), antes que comiencen a producir sus daños.

Esta poderosa acción destructiva realizada sobre insectos dañinos nos obliga a protegerlos durante el combate de las plagas con insecticidas. Por esta razón el autor sugiere la urgente necesidad de limitar también los monocultivos, por lo menos realizando siembras intercaladas de otros cultivos, en los cuales se pueda mantener la cría de los predatores durante los tratamientos químicos de los campos. En caso de *Alabama argillacea,* reducir los tratamientos químicos combatiendo esta plaga en las partes del campo fuertemente atacadas, dejando sin tratar las partes

donde orugas aisladas no pueden producir daños a las cosechas; de esta manera no sólamente rebajamos los gastos sino que protegemos a la vez los predatores y parásitos.

La última sugerencia del autor es contradictoria con los métodos, generalmente aplicados en el combate de *Alabama argillacea* en Venezuela y por eso debe ser aclarada. Este noctuido, hasta el año 1948 se creía que exclusivamente podía desarrollarse sobre algodón (Wolcott 1929, 1948) y por eso se ha tratado de matar todas las larvas para reducir de tal modo la multiplicación de la plaga. Sólamente en el año 1948, los Dres. F. Fernández Yépez y Luis A. Salas descubrieron en Venezuela un nuevo huésped, una malvácea silvestre, *Hibiscus sulphureus* H. B. K. sobre la cual *Alabama argillacea* se desarrolla en condiciones naturales. (F. Fernández Yépez y Luis A. Salas, 1950).

El autor demostró en el año siguiente (1949), que *Alabama argillacea* se desarrolla normalmente en dicho huésped en una vasta zona de Venezuela, que comprende los Estados Barinas, Portuguesa, Lara, Cojedes, Yaracuy, Carabobo, Aragua, Guárico y Miranda. El insecto puede completar 2 ó 3 generaciones seguidas en dicha planta, antes de que las siembras de algodón sean comenzadas y continúa desarrollándose en dicha malvácea, aunque con menos intensidad, durante los meses de julio a septiembre, época de crecimiento del algodonero. En esta forma existe siempre un número suficiente para renovar la infestación del algodonero aún cuando se pudiera lograr la disminución total de las larvas, de los campos cultivados por medio de tratamientos químicos.

RESUMEN

Se han estudiado los coccinélidos más comunes en los Estados Aragua y Carabobo: *Coleomegilla maculata* Deg., *Cycloneda sanguinea* L., *Scymnus limbaticollis* Muls., *Scymnus tardus* Muls., *Hiperaspis connectens* Thumb. e *Hiperaspis festiva* Muls., como predatores de insectos dañinos en Venezuela. Se comprobó que *Coleomegilla maculata* y *Cycloneda sanguinea* destruyen huevos y larvas de varios instares de *Alabama argillacea* (Hbn.), *Laphygma frugiperda* S. & A., *Feltia subterranea* F., *Prodenia latifascia* Walk., *Agrotis repleta* Walk. y *Diatraea lineolata* Walk.

Coleomegilla maculata muestra una predilección por los huevos de lepidópteros proporcionados simultáneamente con áfidos, mientras que *Cycloneda sanguinea* prefiere los áfidos. Los huevos de *Sacadodes pyralis* Dyar no son destruídos por ninguno de estos dos predatores. Los huevos de *Dysdercus* sp. raras veces son atacados por *Coleomegilla maculata*, mientras que ambos predatores destruyen sus propios huevos y se destruyen recíprocamente y también existe un alto grado de canibalismo, entre sus larvas, y la destrucción de las larvas por los adultos.

Scymnus limbaticollis e *Hiperaspis* sp. raras veces destruyen los huevos o larvas pequeñas de *Alabama argillacea* y esto en pequeño número, presentándose junto con *Scymnus tardus*, como poderosos predatores de áfidos.

En el campo se observó una correlación entre la presencia de *Alabama argillacea* y los coccinélidos *Coleomegilla maculata* y *Cycloneda sanguinea* en el algodonero.

También se observó en siembras de maíz la completa ausencia de larvas de *Laphygma frugiperda* en presencia de numerosos coccinélidos.

El ciclo de desarrollo para *Coleomegilla maculata* es: incubación de 3 a 4 días; período larval de 9 a 17 días; pupa de 4 a 12 días; preoviposición de 8 a 25 días y número de huevos 568.

Se sugiere la necesidad de reducir los monocultivos y los tratamientos químicos con el objeto de proteger los predatores y parásitos, y en caso del combate de *Alabama argillacea*, limitar la aplicación de insecticidas a las partes del campo infestadas.

SUMMARY

The author studied some of the predatory Coccinellidae commonly found in the States of Aragua and Carabobo, Venezuela, in relation with insect pests. The following species are discussed: *Coleomegilla maculata* DEG., *Cycloneda sanguinea* L., *Scymnus limbaticollis* MULS., *S. tardus* MULS., *Hiperaspis connectens* THUNB. and *H. festiva* MULS.; the predatory action of the first two upon eggs and larvae of *Alabama argillacea* (HBN.), *Laphygma frugiperda* S. & A., *Feltia subterranea* F., *Prodenia latifascia* WALK., *Agrotis repleta* WALK. and *Diatraea lineolata* WALK. is proved.

Coleomegilla maculata prefers lepidopterous eggs to aphids when both are offered simultaneously while *Cycloneda sanguinea* prefers aphids, but both species do not destroy the eggs of *Sacadodes pyralis* DYAR. Adults of *Coleomegilla maculata* and *Cycloneda sanguinea* destroy each others eggs and larvae as well as their own, and both show a high degree of cannibalism as larvae.

Scymnus limbaticollis and *Hiperaspis* sp. seldom destroy eggs or small larvae of *Alabama argillacea*, and then in reduced numbers, being, together with *S. tardus*, important predators of aphids.

In the field was observed a correlation between the number of *Alabama argillacea* and the abundance of *Coleomegilla maculata* and *Cycloneda sanguinea* found in cotton; in corn (maize), no larvae of *Laphygma frugiperda* were found when the Coccinellids were abundant.

The development of *Coleomegilla maculata* is given as follows: incubation, 3-4 days; larval period, 9-17 days; pupa, 4-12 days; preoviposition, 8-25 days; and total number of eggs laid, 568.

The author suggests the convenience of reducing extensive cultivation and chemical treatments to protect the predatory Coccinellids and in the case of *Alabama argillacea*, to reduce the application of insecticides to the infested zones of the fields.

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